

Te the right VVor^{full} Sir Iohn PAITON
 Knight, Gouvernour of his mai^{ties} Isle of Iersey, I. T.
 wisheth worlds pleasure and heauens happinesse.



HE Bee (right Worshipfull) by ferious industry gathering a certaine hidden vertue from sundry sortes of Flowers and Herbes, and making thereof (by labour and trauell) a materiall Lumpe, namely the Hony. combe : is not therefore to be condemned by any, but rather commended of all. The Physician of many simples making one compound medicine, doth not onely thereby reape profit to himselfe, but applaudity to others : And the studious Reader , out of many Authors select some chiefe principles which hee recordeth as memorials, cyther to profit himselfe, or to pleasure others.

Of these two comparisons , the first is excellent for imitation in generall : the second very necessary for diuers in particular : and the last (though not so highly esteemed of the common sort of people, by reason of their ignorance in Arts and Sciences, yet for the good that may come thereby to a Common-wealth) nothing inferiour to the best : especially , where their study tendeth to good and vertuous exercises , or the practise and contemplation thereof to laudable Arts and Sciences. Of which Arts, namely Mathematicall , Nauigation being a principall member, as having participation in Arithmeticke, Geometry, Geography, Cosmography, & Astronomy, or rather to say the truth, being the quintessence of them all, yea the prooffe and triall of them : for albeit that men reade or heare neuer so much of Cosmography, or Astronomy, yet without practise and experience it is vnperfect: and how can perfection be attayned, but by sayling, and transporting from place to place, thereby beholding the diuersitie of dayes and nights, with the temperature of the Ayre in sundry Regions , whereby the

450

Dep. Masters Room
A.I.



George Johnston

Charles Barker

1849.



RB23. a 10742.

(1-6)

$$\begin{array}{r} 1841 \\ 1630 \\ \hline 211 \end{array}$$



To the right **W**or^{full} Sir I O H N PAITON
Knight, Gouvernour of his Ma^{ties} Isle of Iersey, I. T.
wisheth worlds pleasure and heauens happinesse.



HE Bee (right Worshipfull) by serious industry gathering a certaine hidden vertue from sundry sortes of Flowers and Hearbes, and making thereof (by labour and trauell) a materiall Lumpe, namely the Hony. combe : is not therefore to be condemned by any, but rather commended of all. The Physician of many simples making one compound medicine, doth not onely thereby reape profit to himselfe, but applaudity to others : And the studious Reader, out of many Authors select some chiefe principles which hee recordeth as memorials, eyther to profit himselfe, or to pleasure others.

Of these two comparisons, the first is excellent for imitation in generall : the second very necessary for diuers in particular : and the last (though not so highly esteemed of the common sort of people, by reason of their ignorance in Arts and Sciences, yet for the good that may come thereby to a Common-wealth) nothing inferiour to the best : especially, where their study tendeth to good and vertuous exercises, or the practise and contemplation thereof to laudable Arts and Sciences. Of which Arts, namely Mathematicall, Nauigation being a principall member, as having participation in Arithmeticke, Geometry, Geography, Cosmography, & Astronomy, or rather to say the truth, being the quintessence of them all, yea the prooffe and triall of them : for albeit that men reade or heare neuer so much of Cosmography, or Astronomy, yet without practise and experience it is vnperfect : and how can perfection be attayned, but by sayling, and transporting from place to place, thereby beholding the diuersitie of dayes and nights, with the temperature of the Ayre in sundry Regions, whereby the

The Epistle Dedicatory.

whole course and revolution of the Sphere is made apparant to Mans capacite? And by what meanes can Sayling be performed, but by Navigation? Which so being, it may be affirmed that as the Mathematicall Sciences are the grounds of Navigation, so is Navigation the onely meanes, whereby the excellencie of those Arts and Sciences, are proued and layd open to the view of the World. Therefore very aptly may Arts be tearmed, The mirror of Nature; because that by Artes, the wonderfull and hidden secrets of Nature are reuealed; and Navigation may be called, The tryall of Arts, being that thereby the whole study of Arts is proued to bee true. The reasons mouing mee, as also being many times conuersant with Sea-men and Mariners, whereby I perceiued what they (I meane the common and plainer sort of them) chiefly desired: at my best leysure I made a collection of such Tables and Rules, as I thought fittest for their purposes: and being instantly vrged by diuers to publish them, although I was very loath to aduenture my simple labours to the common view of carping Censurers: Yet at last (hoping well for the best, and not greatly respecting the worst) I resolued to hazard my Papers to the Presse, and (as the common custome of the world is) thinking vpon a Patron, to protect it from the malicious slanders of malignant spirits, I presumed vpon your Worships fauour in two respects: The one in consideration, that your selfe being so well acquainted in the Artes Mathematicall, would (though not in respect of the Author, yet for affection to the matter) vouchsafe the protection of them: The other, that being in duty bound to be at your Worships pleasure, I know not how I might shew my selfe dutifully affected, better then by dedicating my (though vnpolisht yet well-willing) labours to your fauourable disposing, beseeching your Worship to accept of them, And to pardon my boldnesse; And so with my daily prayers to God for your health and prosperous successe in all your actions, I rest:

*Your Worships most dutifully
to be commanded,*

JOHN TAP.



15-12-93



TO THE COVRTEOUS *Readers Health.*



Entle and indifferent Readers, whose judgements are not so Sophistically mixed with humorous conceits, and quipping quidities, (as many are now a dayes) who are apter with their turbulent tongues to condemne all things, then with sensible judgements to amend any thing: as for them or any such Carping Zoylists, I am indifferently perswaded to set as lightly by their partiall and injudiciall censures, as they are farre from hauing a good opinion of ought but what is agreeable to their owne fantastick fictions: Onely to them that are of more plausible spirits and grauer judgements, who (for the most part in reading) applaud that which is good, and passe ouer with silence that which is not hurtfull, without scoffing at the worke, or deriding the Author, and to those that hauing small vnderstanding, are desirous of more knowledge in the Art of Nauigation, and other Mathematicall studies: To the one I commit the censuring of my worke, and to the other the profit of my labours; knowing that the wise will rather winke at small faults, then rashly reprove that which may profit others, though not pleasure themselves. And though (as I say) the curious and expert Mariners finde nothing herein contained which may satisfie their expectation, yet I hope they will judge fauourably of my intention, and with patience passe it ouer for affection to the Art it selfe, wishing charitably that my skill were answerable to my will. As for the meaner sort, whose experience haue not bene fitted with Arts Rudiments, nor their judgements fined

To the Reader.

with demonstratiue illustrations in the Mathematicall Sciences, but onely are now (as it were) setting themselves with willing mindes to learne what they before wanted, I make no question, but as by these following Tables and Propositions they may reape profit, so accordingly, in yeilding friendly censures vpon me and my workes, they shall answere my expectation, with a full recompence of my passed labours. Further, I haue added hereunto for the better confirmation of my love vnto the practisers in this Art: I meane such as are not acquainted with the doctrine of Triangles, the explanation of Master *Ralph Handsons* 5. Nauticall Diagrams in his 5. seuerall Cases for finding the Sunnes Azimuth, by him wrought by the Canon of Triangles in *Pitiscus*, and here amplified onely to the abridged Table of Sines, towards the later end of this Booke. Further intreating the courteous Readers, to doe me that fauour, as to correct what they shall find amisse, either in the Printers ouersight, or mine owne error, and I shall not onely endeouour the mending of them in the next Impression: but also be very thankfull to them that at any time shall giue me notice thereof, resting withall

Your obliged friend,

IOHN TAP.

The Propositions follow.

To the Reader.

I.

For the Sunnes *Azimuth* hauing no Declination.

ADde the Complement of the *Latitude*, to the complement of the *Almicanter*, which if the totall be more then a Quadrant, subtract 90. and set downe the Sine of the remainder for the first number. Againe, adde the complement of the *Latitude* and the *Almicanter*, & adde the sine therof to the former: from the one halfe of that totall subtract your first number or sine, and set downe the remainder. Then As the $\frac{1}{2}$ of the 2. first numbers added is in proportion to the whole sine, so is the said remainder to the sine of the Sunnes true *Azimuth*.

Example.

Latit. 51.d.30'. the Compl. 38.d.30'. } Added makes 108.d.30'.
Almicanter. 20.d. Complement 70. 0. } 90. subtracted, leaues
 18.deg.30'. whose sine 3173. is the first number. Againe, complement of the *Latitude* 38.deg.30'. *Almicant.* 20.d. added makes 58.30'. whose sine 8526. is the second number, those 2. numbers added makes 11699. the $\frac{1}{2}$. thereof 5849. from which subtract 3173. the first number rests 2676. for the remaine: then say,

As 5849. the $\frac{1}{2}$ of the 2. first numbers is to 10000. the whole sine, so is 2676. the remainder to the *Azimuth* desired.

Facit, 4575. whose arch 27.deg.14'. is the *Azimuth* from the East Southward.

2. When the Sunne hath North Declination, the 2. Complements being equall to a quadrant.

ADde the complement of the *Latitude* with the *Almicanter* only, and from $\frac{1}{2}$. the sine thereof, subtract the sine of the Declination, and setting downe the remainder.

As the $\frac{1}{2}$. aforesaid, is to the whole sine, so is the remainder aforesaid to the sine of the *Azimuth* desired.

3. When the Sunne hath North Declination, the 2. Complements lesse then a quadrant.

ADde the complement of the *Latit.* and the complement of the *Almicant.* setting downe the sine of the complement thereof, then

To the Reader.

then adde the *Almicanter* and the complement of the *Latitude*, and from the sine thereof subtract the former, setting downe $\frac{1}{2}$. of the remaine for the first found number : againe, subtract the sine of the first Complement from the sine of the Declination and the remaine thereof, againe subtract from your first found number, and set the remaine thereof downe for your second number : and then,

As the first found is to the whole sine, so is the second to the *Azimuth* desired.

4. When the Sunne hath North Declination, and the 2. Complements more then a quadrant.

ADde the Complement of the *Latitude* : and complement of the *Almicanter*, which being more then 90. subtract 90. and set downe the sine of the remainer, then adde *Almicant.* and complement of the *Latit.* and set downe the sine thereof, adde both the sines together and take the $\frac{1}{2}$. thereof for the first found number, then to the sine of the first 2. complements adde the sine of the Declination, and from that totall subtract the first found, and set downe the remainer for the second found : and then,

As the first found is to the whole sine, so is the second found to the sine of the *Azimuth* desired.

5. When the Sunne hath South Declination, and the 2. Complements more then a quadrant.

ADde the 2. Complements, subtract 90. set downe the sine of the remainer, adde also the *Almicant.* and complement of *Latit.* adde both their sines and set downe $\frac{1}{2}$. of the totall for the first found, then subtract the sine of the Declination from the sine of the remaine of the first 2. Complements, and that remaine againe from the first found, which last remaine set downe and say,

As the first found is to the whole sine, so is the second found to the sine of the *Azimuth* desired.

Certaine



Certaine Definitions, meet to bee vnderstood of those
that will practise Navigation.



Sphære or **Globe**, is a round figure, made by the turning of halfe a Circle, till it end where it began to be moued; or a massie body inclosed with one platfome or surface: In the middle whereof is a pꝛicke, from which all Lines drawne to the surface are equall.

Center, is the point or pꝛicke aforesaid, in the Middle of a Sphære, Globe, or other Circle.

Diameter, is a right Line drawne thꝛough the Center, to the Circumference or surface of a Sphære or circle to each side therof.

Circumference, is a round Circle equally distant on all sides from the Center thereof.

Surface or **Superficies**, is the vpper part of any thing.

A Degree, is the 360. part of a Circumference of any Circle.

A Minute, is the 60. part of a Degree, being vnderstood of measure: but in time, a minute is the 60. part of an houre, or the fourth part of a degree, 15. degrees answering to an houre, and 4. minutes to a degree.

The Pole, is a point or pꝛicke imagined in the heauens whereof are 2. the North Pole being the Center, to a Circle described by the motion of the North Starre, or the tayle of the litle Beare: from which point aforesaid, a line imagined to passe thꝛough the Center of the earth and passeth directly to the opposite part of the heauens, sheweth the South Pole.

The Equinoctiall, is a great Circle, imagined in the heauens also deniding the Heauens into 2. equall parts, and lying iust in the middle between the two Poles, being in compasse from West to East, 360. degrees, euery degree of terrestriall measure, valuing 20. English leagues, or 60. miles.

The Sea-mans Kalender.

The Meridian is a great Circle, deviding the Equinoctiall at right angles into two equall parts, passing also through both the Poles and the Zenith: to which Circle the Sunne comming twice euery 24. houres, maketh the middle of the day, and the middle of the night.

Note that euery place hath a feuerall Meridian, which doe all meet together in the Poles of the world.

Zenith, is a poynt or pꝛicke in the Heauens, right ouer our heads, 90. degrees from the Horizon, as the Pole is 90. degrees from the Equinoctiall.

Nadir, is a poynt or pꝛicke in the heauens vnder our fete, opposite to the Zenith.

Horizon, is a great Circle, deviding that part of the Heauens which we see, from the other part we see not.

Azimuth, is a great Circle, crossing the Horizons at right angles as the Meridians doe the Equinoctiall, being as many as the Meridians: and as the Meridians concur and meet together in the Poles of the world, so doe the Azimuthes meet in the Zenith, which is the Pole of the Horizon,

Parallels, are Lines or Circles equally distant in all parts one from another, as all Circles of East and West are parallel to the Equinoctiall.

Almicanterahs, are Circles parallel to the Horizon, being also Circles of Altitude or Elevation, being that the Altitude of the Sunne, Moone, or Starres aboue the Horizon are described there by: which Almicanterahs doe crosse the Azimuthes, as the Parallels or Circles of East or West doe crosse the Meridians.

The Tropickes, are two lesser circles parallel to the Equinoctiall, limiting the bounds of the Zodiacke or the greatest declination of the Sunne on each side of the Equinoctiall. The Tropicke of Cancer Northward, and the Tropicke of Capricorne Southward, whose distance from the said Equinoctiall are 23. deg. and 31. min.

The Zodiacke, is a great Circle crossing the Equinoctiall in two opposite places thereof and swaruing by as wise therefrom towards eyther of the Poles, touching the Tropick of Cancer on the North

The Sea-mans Kalender.

North part and the Tropick of Capric. on the South part thereof : In the Zodiacke are 12. Signes : viz. Arie., Tau. Gem. Can. Leo. Virg. Libra, Scorp. Sagit. Capr. Aqua. Pisces, euery signe being 30. deg. in length, and 12. in bredth : through which signes the Sunne passing, describeth a yere, and the Moone passing likewise through the same, makes a Moneth ; the 12. degrees that the Zodiacke hath in bredth, are allowed for the Latitude of the Planets.

Eclipticke, is a Circle lying just in the middle of the Zodiacke, out of which the Sunne neuer goeth, but the Moone and other Planets are sometime on the one side, and sometime on the other side thereof, in which the head and tayle of the Dragon also is.

The head and tayle of the Dragon, are two opposite points in the Ecliptick line of the Zodiacke, which goeth backward through all the 12. Signes in 19. yeares : And when it hayneth that the Sunne and Moone are in Coniunction, in that place of the Eclipticke where the head or tayle of the Dragon is, then is the Sunne eclipsed, and being in the Oppositions, the Moone being in eyther of the said points, the Moone shall be Eclipsed.

The Circle Articke, is a Circle which incloseth all those starres which doe neuer rise or set in any latitude, but are alwayes aboue the Horizon where the North pole is raised : the like is vnderstood of the Circle Antarticke, where the South pole is raised.

The Polar Circles, are 2. little circles distant from the Poles of the world, so much as is the greatest declination of the Zodiacke from the Equinoctiall : in which Polar Circles are the Poles of the Zodiacke.

Colures, are two great Circles passing through both the Poles, crossing one another in the said Poles at right angles, and diuiding the Equinoctiall and the Zodiacke into 4. equall parts, making thereby the 4. seasons of the yere. The one Colure passing through the Equinoctiall poynts of Aries and Libra, sheweth the beginning of the Spring time and Autumne, which 2. times, the dayes and nights are equall. The other Colure passing through the 2. Tropicall poynts of Cancer and Capricorne sheweth the beginning of the Summer and Winter : at which 2. times, the dayes and nights are longest and shortest.

The Sea-mans Kalender.

Altitude, in the Heauens, is the height of any thing aboue the Horizon towards the Zenith.

Latitude, is the widenesse or distance of the Planets or Starres from the Ecliptike, either Northward or Southward. Also Latitude is the distance of the Zenith of any place from the Equinoctiall, towards either of the Poles, which is alwaies equall to the height of the Poles of the same place.

Longitude, is length, and in the heauens it is vnderstood the distance of any Starre or Planet, from the beginning of Aries to the place of the said Planet or Starre, or from the beginning of any line to a certaine other part or degree of the same line: Otherwise, longitude in the earth, is the distance of the Meridian of any place, from the Meridian which passeth ouer the Isles of Azores, where the beginning of longitude is said to bee Longitude, is counted vpon the Equinoctiall, and Latitude vpon the Meridian.

Declination, is the declining or distance of the Sun, Moone, or Starres from the Equinoctiall, and is said to be North or South, according to the Pole towards which it leaneth.

Amplitude, is the distance of the rising and setting of the Sun, Moone, or Starres, from the true East or West point of the compass vpon the Horizon.

Ascension, is the rising of any Starre, or of any portion of the Ecliptike aboue the Horizon. Right Ascension, is the number of degrees and minutes of the Equinoctiall, which commeth to the Meridian with the Sun, Moone, Star, or any portion of the Eclipticke. Oblique Ascension, is the numbers of degrees of the Equinoctiall Starre or any portion of the Eclipticke: in which sort is Oblique Descension also.

Ascensionall difference, is onely the remainer, the one being subtracted or taken from the other.

The Golden number or Prime, is the time of 19. yeeres: in which time the Sunne and Moone make all varietie of their Conjunctions, Oppositions, and other Aspects.

Epa⁷, is the 11. dayes and 6. houres, which are added to the yeare of the Moone, being 354. dayes, to make it equall with the yeare of the Sunne, which consisteth of 365. dayes $\frac{1}{4}$. By the

The Sea-mans Kalender.

the Prime, is found out the Epact : and by the Epact is found out the age of the Moone.

The Circle of the Sunne, is the number of 28. because that in 28. yeares all the variety of Dominicall or Sunday Letters and Leape yeares are expired, being that at the 29. yeare the said Circle doth begin againe : the vse of the which number is to find out the Dominicall Letter for any yeare past, present, or to come : Where note, that there is but 7. letters which serue for Sunday letters, viz. A B C D E F G. And albeit, that in the dayes of the weeke, they proceed according to their naturall order of the Alphabet, yet in the yeares they goe backward : As if G, be for one yeere, F, shall be for the next : and when it is Leape yeare (which is euery fourth yeere) then is there 2. Letters for the yeare the first seruing from the first of Iannary till St. Mathias day, which is then the 25. of February, and then the other letter takes place, and serues till the end of the yeare.

To find which number of the Sunnes circle, and consequently the Dominical letter for the yeere proposed to the yeere of our Lord, adde 9. that totall deuide by 28. and that which remaines, is, The Circle of the Sun for that yeere : Then to know the Dominicall letter : note that the 28. yeere the dominicall letter is A, and is the third from the leape yeare : therefore the first to begin withall againe, is G F. because it is another leape yeere, and so counting the 7. letters backward, and euery fourth yeere counting 2. letters : that letter vpon which the number of the Sunnes circle ends, shall be the Sunday letter for the yeere proposed.

As for Example

The yeere 1627. adding 9. thereto, it makes 1536. that being deuided by 28. the remainer is 12. the circle of the Sunne : then counting 12. Letters backward according to order till I haue counted 12. places, beginning with G F, thus : 1. G F, 2. E, 3. D, &c. I find that the 12. place ends vpon G, which I conclude to be the Dominicall letter for the yeere aforesaid : and it is the third yeere after leape yeere.

And here is to be noted that the Prime and Dominicall Letter, changes the 1. day of Iannary, and the Epact the 1. day of March.

To

The Sea-mans Kalender.

To finde out the Prime.

Diuide the yeare of our Lord by 19. and to that which remaineth after the diuision, adde one : the Product is the Prime number for all that yeare.

As for example.

I would know the Prime for the yeare 1627. diuide 1627. by 19. and you shall haue in the Quotient 8. and after the diuision there, rests 12. vnto which if you adde 1. it makes 13. which is the Prime for that yeare 1627.

To finde out the Epact.

Adde to the Epact of the yeare past 11. and if it passe 30. take away 30. and the Product is the Epact for all that yeare : but otherwise, which is the better way : Imagine three places vpon your hand, which for example let it be the three joynts of your fingers, and call or name the first joynt 10. the second 20. the third 30. then count the Prime number vpon the 3. joynts aforesaid, and going ouer them vntill you come to the end of the said Prime number, marke vpon which your prime ends, and adding the number of the joynt with the Prime, if they come not to 30. that shall be the Epact for all that yeare : If they passe 30. take away 30. and the remainder is the Epact, if it be iust 30. then is the Epact equal to the Prime.

As for Example.

The yeare 1627. the Prime is 13. and imagining the first joynt of my finger to be 10. the second 20. the third 30. I count vpon the 3. joynts 13, the Prime number, viz. vpon the first joynt I tell 1. on the second 2. on the third 3. Againe, on the first 4. the second 5. and so to 13. which is the Prime, ending vpon the first joynt, which I call 10. therefore adding 10. the number of the first joynt, makes 23. for the Epact of the yeare 1627. aforesaid.

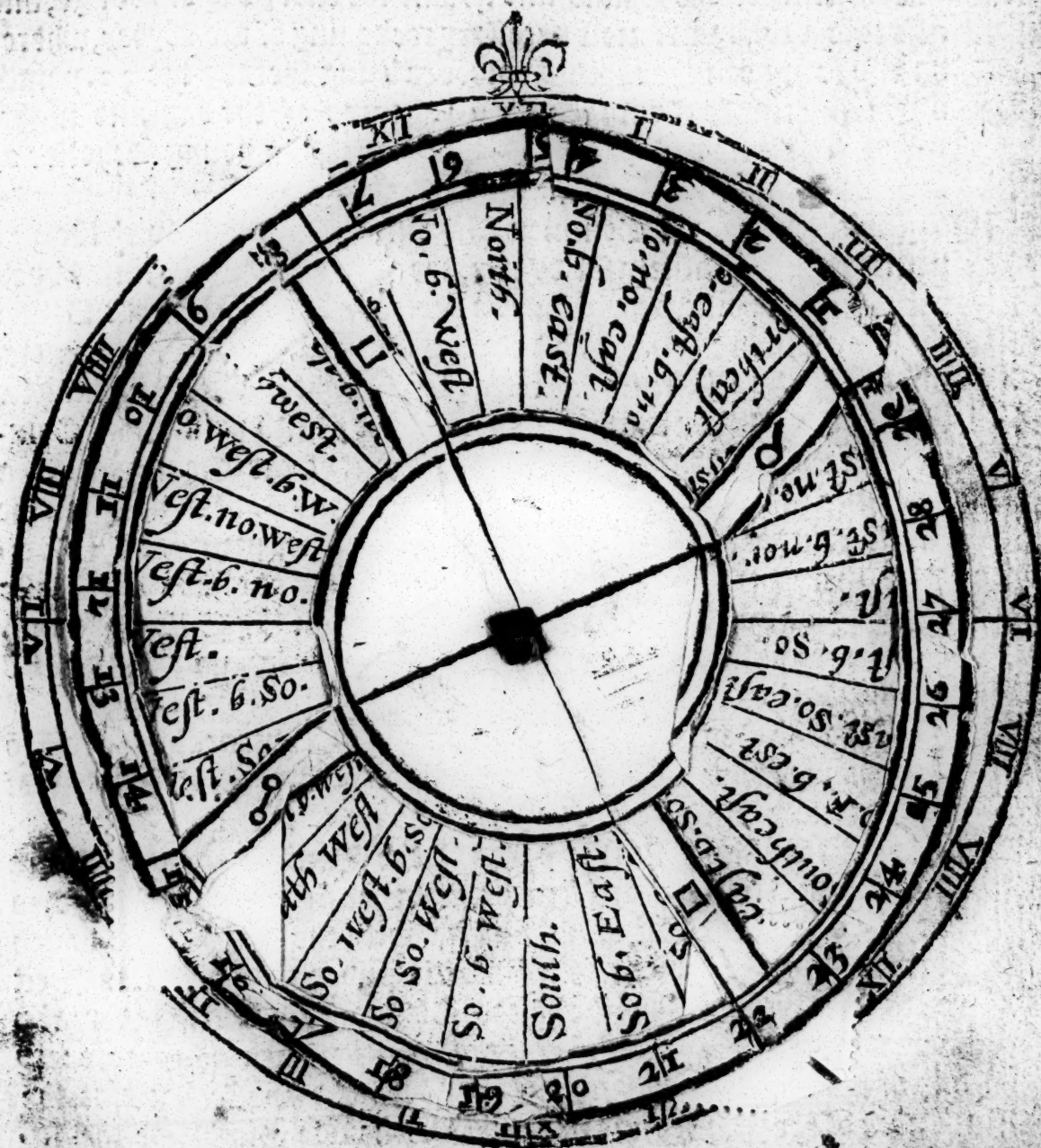
To know the Moones age.

Adde to the day of the Moneth, the Epact, and so many dayes moze as are Moneths from March to the Moneth you are in, including both Moneths, and if they come not to 30. so much is the Moones age : But if they passe 30. take away 30. and the ouerplus is the Moones age.

This

The Sea-mans Kalender.

This is when the Moneth hath 31. dayes, but if the Moneth hath but 30. dayes, you must take away but 29. and the rest is the age aforesayd, for in those Moneths that haue 31. dayes, the Coniunction is the 20. day of her age, and those Moneths that haue but 30. dayes, the Coniunction is the 19. day of her age.



A Declaration of the former Instrument.

This Instrument gives you a plaine and easie order, for the shifting of the Sunne and Moone for every day of her age, and also it is a ready and most necessary reckoning of the Tydes, where by also is shewen the common order to bring thereby the 32. points of the Harriners Compasse to 24. houres of the day and night, which are the first Rudiments to be learned of a young Scholler or Apprentice in Nauigation.

First, here is the Common Harriners Compasse, with the 32. points thereof plainly set downe, the names being Printed vpon each severall point, which must be perfectly learned without Booke then is there in the uttermost edge, a Circle divided into 24. parts which signifie 24. houres of the day and night, where you may see that 12. a Clocke at night, is iust vpon the North point of the Compasse: 12. at Moone vpon the South point of the Compasse: 6. a Clocke in the Morning, vpon the East: and 6. at night, vpon the West point of the Compasse: and for the other points of the Compasse there agreeing with the houres, every point of the Compasse makes $\frac{1}{4}$. of an houre as you see by North and by East, is vpon $\frac{1}{4}$. of an houre past 12. North Northeast one houre and $\frac{1}{4}$. Northeast and by North 2. houres and $\frac{1}{4}$. and consequently of the rest.

Also to the Center of the Compasse is fixed a moueable Circle to turne round about the sayd Compasse; the uttermost edge whereof moving close within the Circle of houres, is deuised into 29. equall parts, signifying the dayes of the Moones age, which are numbred in Arithmetical figures, from the first day of her age, to her Coniunction or meeting againe with the Sunne: at which place of her Coniunction, is left a little Index or Hewer, to direct you to the houres and points of the Compasse: which Index also shewes you how much the Sunne and Moone are asunder every day of her age, bytelling the points of the Compasse betwixt the number of the Moones age in the said moueable Circle and the Index thereof, accounting every point for 11. degrees, and $\frac{1}{4}$. or other wise

The Sea-mans Kalender.

Astronomers, saith, that as the dayes and nights doe increase or decrease, so must the Planetary houres be longer or shorter accordingly, neuerthelesse, so that there shall be 24. planetary houres in the day and night, as well as of other houres: but that if the day consist of more then 12. houres, then proportionally the planetary houres to consist of more then 60. minutes: and if the day be lesse then 12. houres, then the planetary houres to be lesse then 60. minutes: and if the day be iust 12. houres, then the planetary houres are equall to the houres of the clockes, and not otherwise. The like is to be vnderstood of the nights: and to make an equality of the planetary houres to them of the clockes, being that how long soeuer the day is, yet there must be but 12. planetary houres: and how short soeuer the day is, there must (neuerthelesse) be 12. planetary houres, and so of the night: by which you see that the planetary houres are sometimes greater and sometimes lesser then the common houres of the clockes, which alwayes consist iust of 60. minutes: therefore if you deuide the day into 12. equall parts, one of those parts shall be the quantity of a planetary houre, which you may doe thus: multiply the houres of the day into minutes by 60. & if there be any odde minutes, adde them to the product, the totall being deuided by 12. the quotient shewes the number of minutes contayned in an vnequall or planetary houre.

And againe, if at any houre of the day or night you knowe not what planetary houre it is, that is to say, how many planets haue ruled since the beginning of the day or night proposed: multiply the number of the houres past from Sunne rising by 60. and deuide the product by the number of the minutes contayned in an vnequall or planetary houre, the quotient will shew you how many houres and minutes of the Planets are past from the Sunne rising (if it be in the day) or from Sunne setting, if it be in the night: which knowne, enter the Table, following to know what Planet rules the day and houre proposed, looking for the houre desired in that Columnne which is right vnder the day proposed: those Planets which are gouernours of the said houres in the day time, being placed on that side next the left hand, and the gouernours of the night on the right hand.

The Sea-mans Kalender.

Example.

The 18. day of May being Sunday at 9. of the clocke in the morning, I would know what Planet rules: First, in the following Kalender, I finde that the 18. of May the day is 16. houres long: therefore I multiply 16. houres by 60. minutes, and the product is 960. that deuided by 12. brings in the quotient 80. minutes for the length of a Planetarie houre at

Gouernors of the day.	Sunday.	Munday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Gouernours of the night.
Sol,	1	12	9	0	10	0	11	Iupit.
Venus,	2	0	10	0	11	1	12	Mars.
Mercurie,	3	0	11	1	12	2	0	Sol.
Luna,	4	1	12	2	0	3	0	Ven.
Saturne,	5	2	0	3	0	4	1	Merc.
Iupiter,	6	3	0	4	1	5	2	Luna.
Mars,	7	4	1	5	2	6	3	Satur.
Sol,	8	5	2	6	3	7	4	Iupit.
Venus,	9	6	3	7	4	8	5	Mars.
Mercurie,	10	7	4	8	5	9	6	Sol.
Luna,	11	8	5	9	6	10	7	Ven.
Saturne,	12	9	6	10	7	11	8	Merc.
Iupiter,	0	10	7	11	8	12	9	Luna.
Mars,	0	11	8	12	9	0	10	Satur.

that time: then from 4. of the clocke (the time of the Sunne rising) till 9. a clocke, the houre proposed is 5. houres, which multiplied by 60. brings 300. that deuided by 80. (the length of a Planetarie houre) brings in the quotient 3. houres and 3. quarters: so I conclude, that at 9. of the clocke, 3. Planets haue past their Regiment, and the 4. hath ruled 3. quarters of his houre: therefore vnder the title Sunday in the top of the Table, I looke for 4. toward the side of the sayd Table, against which on the left hand is placed Luna, therefore I say, that the 18. day of May being Sunday, at 9. of the clocke in the Morning, Luna shall haue reigned 3. quarters of her houre.

A Rat.



*A Rutter, for the Courses round about
Ireland, from Cape to Cape, and what Tydes
it makes in euery Harbour, and how many
Leagues it is from Harbour to
Harbour.*

In *pprimis*, from Cape-cleere to the Mison-head, is 7. leagues,
and lyeth *West* and by *North*, and *East* and by *South*, you
shall finde a *Hauen* north-west from Cape-cleere, called *Crooke*
Hauen, and it floweth there *East North-east*, and *West South-*
west, you must goe *West* to enter into it.

From the Mison to the Durzib, is 7. leagues, and lyeth *West*
north-west, and *East* south-east.

Beare *Hauen* lyeth from the Mison-head, north north-west 3.
leagues and a halfe, you must goe north-west into the *Hauen*, it
floweth east north-east and west south-west: if you will anchor be-
twene the Durzib and the maine Land, you must goe aboard the
Iland, for the east side is not sound.

The 3. Ilands that be of the point of the Dowrries, which is
called the Bull, the Cow and the Calfe, they be sound, you may
goe within them or else betwene them, for there is no danger
but what you see.

Dowrries, and Blaskey, lye *North* and by *west*, and *South* and
by *east*, and there is betwixt them 12. leagues, the Skellocks is
betwene both, and it floweth north-east and south-west.

North-east of the great Skellocks a 2. leagues off, you shall find
the entry of Vallens, you must runne east south-east to enter in, it
floweth *East* north-east, you must borrow of the Iland to enter

The Sea-mans Kalender.

in, for the point of the Easter side is long.

North northeast of the great Scellocks, 6. leagues off, you shall finde the Hauen of the Ventry which is a good Road: It floweth East northeast.

N. E. by N. of the great Scellocks, 7. leagues, you shall finde the Hauen of Dinggell, and without the Hauen is a Rocke called the Croo, which is found on both sides: the Rocke doth not couer but on a spring-tyde: you must runne north west and by west into the Hauen, it floweth east northeast, and south south west.

The Ventry and the sound of Begue lyeth south by east, and north by west 3. leagues, and when you are past into the sound of Begue, you must lye east and by north in the roade against a red cliff which is on the south side.

Southeast of the sound of Blaskey, a 6. leagues off, you shall finde a good harbour named Begue, which is to the Northeast of Valence: The sayd Hauen hath two entries, but to the West side is the best: You must take great heede of a loncke Rocke that is on the Islands side, which you must leaue on your Larboard side going in, and it floweth East northeast, and West south west.

You shall vnderstand, that the sayd sound of Blaskey lyeth southeast and north west, but you must take heede of a shoald that is on the East side athwart the Sezebras.

From Blaskey to Smerricke is 3. leagues, and if you enter into the Hauen, you must goe south west into it: It floweth east northeast, and west south west.

There is a hill to the eastward of Smerricke, which is called Sinbrandon, goe from Smerrick east northeast, and you shall goe with Lopus head, which maketh entry of the Riuer of Limerick, on the north side: there is from one to the other 10. leagues.

Smerricke and the head of the Kerry, lye east northeast and west south west 7. leagues a sunder, and there is within the Bay thre Islands called Salline.

From Lopshead to the Searyes is 7. Lea. they lye E. N. E. and W. S. W. and if you enter into the riuer, take heed of a shoald halfe way betwene Lawpshead and an Island called Starick, which
you

The Sea-mans Kalender.

you must leaue on the Southside, and to the Eastward of that Island is a good roade: It floweth East Northeast, and West Southwest.

From Seatricke to Quoine, is 5. leagues, you must goe East, and you shall finde two Islands, they be flat Islands, goe you to the Northwards hard aboord them, and from thence runne East northeast, and you shall finde a Rocke called the Bieffe, goe hard aboord the South side of the said Rocke, called the Bieffe. And when you are at the said Rocke, you must row Southeast, and you shall finde another Rocke called the small Bieffe, then goe with the Island of the entry of Dorsey, and boztow a boord the Island, as nere as you can, for feare of the banke going into the Hauen, and you must moze at the Castle by foure Cables, for there goeth a great tide, it floweth East northeast, and West southwest.

The Sound of Blaskey, and the Islands of Arrin, lye North northeast, and South southwest, and there is betwene them 16. leagues: the Islands lye East and West, and make the entrance of Galloway and the other Islands: there is one which is naught, but the West sound is good, and the next sound to it is good which is called the little sound, but the sound comming from the East is naught, but the next comming to the Black-shore from the East is partly good, but you must put the two partittons to the Island, for it is dangerous: You must vnderstand that there is one Island in the course way, betwixt Lampshed and the entry of Galloway, that hath a great Name, a league and a halfe off the maine land.

If you goe before the Tolone of Galloway, goe aboord the Black-shore, and bring the Black-shore Southeast of you: then goe Northeast, and you shall fetch the Island called Motton Island, and there is betwene them both 3. leagues: You must not trust to the North shore, for there is a shold halfe way to the Black-shore, and the Island of Motton, is thwart of two white points, which is on the North side.

The sayd shold is vpon the West southwest side of the sayd Island of Motton, a league & a halfe off at spring tide, then shall you

The Sea-mans Kalender.

as it dry, and it floweth at the said Island, East Northeast, and West South-west.

The Sound of Saint Gregory, and the Rode of Galue, lyeth East Northeast, and West Southwest, and there is betwixt them 8. leagues.

The sound of St. Gregory and Silvis head, lyeth Southeast and north-west, and the distance betwixt them is 9. leagues.

Slinshed and Sarke, lyeth North by west, and are distant 15. leagues.

Blacke-rocke, is an Island which is West of Kill-head, a league off the Cape: the said Blacke-rocke and the Stags, lyeth Northeast and by north, and are distant 12. leagues.

From the said Blacke-rocke, runne North, and you shall finde the Island of East Eies, and there is betwene them 12. leagues.

South south-west off the Stags, there is a Haven called Broad-hauen, from the Haven to the Stagges is two leagues: the Stags is a Cape that maketh the entry of the Riuer of Raffin, they lyeth East and west, and are distant 8. leagues: the Stagges and the Cape of Tellen, lyeth Northeast and south-west, and are distant 15. leagues.

Betwixt the Stags and the Cape of Tellen, in the Bay, is the Haven of Moy, the Haven of Portway, the Haven of Slego, the Haven of Ballechennen, the Haven of Dongall, the Haven of Kellekeg, and the Haven of Tellen.

The Cape of Tellen, and the Island of Arron, lyeth North north-east, and South south-west, and are distant 7. leagues.

The Island of Raghlenburne and Tellen, lyeth Southwest and Northeast, and are distant two leagues.

The Island of Raghlenburne, and in the Island of Torre, lyeth North north-east, and South south-west, and are distant 14. leagues.

To the Eastward of Torre, is a Cape called Horne-head, and are distant 2. leagues: Southeast of Horne-head is a Haven called Sheepe-hauen, it floweth East and west, but you shall haue in the Bay a good roade for all winds: the said Haven is a broad Haven, and is two leagues from the Cape.

Horne.

The Sea-mans Kalender.

Horne-head and the entry of Loughfoyle, lye East Northeast, and West Southwest, and are distant 6. leagues.

The entrie of Loughfoyle; and the Iland of Enersterhoulde, lyeth Northeast and Southwest, and are distant five leagues.

The Iland of Torre, and the Iland of Enersterholde, lyeth East and by North, and West and by South, and are distant 9. Leagues.

The entrie of Loughfoyle, and Enersterholde, Southeast and Northwest and are distant five leagues.

The Isles of Enersterhoulde, and Skirris Portrush, lye East Southeast, and West Northwest, and are distant 10. leagues,

You must vnderstand that the Riuer of Loughfoyle lyeth from Skerries Portrush, West Southwest, and East Northeast, and there is betwixt them, the Riuer of the Band: there is betwene Portrush and Loughfoyle, 5. leagues: There is in the entry of Loughfoyle, a sand which is called the Tonnes, which is dangerous for any Ship of charge, also there is a channell of the East side of the Tonnes, hard aboord the shore, but you must haue your tide: It floweth East by South, and West by North: Skerries Portrush and it lyeth South and North, and are distant 12. leagues.

Skerries Portrush, and the Ilands of Raghlin, lye Northeast and by East, and Southwest by West, and are distant 5. leagues: it floweth in Skerries East Southeast, and West Northwest, the flood commeth from the Eastward.

Off the Raghlin, is a Cape called the faire Forland, and betwixt them is a league and a halfe, the faire Forland and the Knee lyeth South Southeast, and North Northwest, and are distant 9. leagues.

The faire Forland and Loughrian in Scotland, lye East Southeast, and West Northwest, and are distant 15. leagues.

There is betwixt the Knee and Carickfergus, 5. leagues.

The point of Loughrian, and the Ilands of Commoras, off Scotland lye North and South, you must passe by Elliso, and by the Hauen of Lambach a sunder 7. leagues.

The Sea-mans Kalender.

The point of Loughrian and Compnam Isles lyeth Northeast, and Southwest.

The Knee and the rocke of the Maydens, lye Northeast by North.

The Knee and Ellse in Scotland, lye Northeast by East, distant 10. leagues.

● Loughrian in Scotland, and the mould of Galue, lyeth South Southeast, and North north west, and are distant 7. leagues.

The Mould of Galue, and the Calfe of Man, lye South south east, and North north west, and are distant 10. leagues.

The Compnam Isles, and the roade Carricke Vergus lye East and West, and are distant 14. leagues, it floweth in the sound East southeast, and West northwest.

Compnam Isles and the point of the Moulens lye South south east, and North north west, and are distant 7. leagues.

The point of the Moulens and the Ile of Lambay, lye South southwest, and North northeast, and are distant 21. leagues.

Lambay and Catlingford, lye North north west, and South southeast, and are distant 18. leagues.

Lambay and the Ile of Dalke, lye South southwest, and North northeast, and are distant 5. leagues.

The banke of Wiclo, beginneth thwart of the Forth of Dublin, and containe to the Ile of Tosker, they lye North by West, and South by East, and they lye in length 24. leagues.

Tosker and the point of the Grenord, lye East and by North, and West and by South, distant 2. leagues.

And when you are bound to the Eastward off the Grenord, you must keepe the Mountaine of Washford aboue the low land, and so you shall goe cleere off all the dangers betwixt you and the shoare: And if you close the Mount with the low land, then you shall goe with the dangers.

Tosker and the Cape of Canwall, lye South by East, and North by West 40. leagues.

Tosker and the Salts, lye East northeast, and West south west, distant 6. leagues.

The Salts and Silly, lye South and North, and are distant three

The Sea-mans Kalender.

thye and thirty leagues.

The Salts and the Tower of Waterford, lye East and West, distant 5. leagues.

The Tower of Waterford and the Ile of Ballecutin, lye South, west and by West, and North-east by East, but betwene the Tower of Waterford and Ballecutin, is a Haven called Yoghall, and a Sea-board it, is an Island called Capell Ile, and betwene Capell Island and Ballecutin, is 4. leagues.

The Tower of Waterford and Heluick-head, lyeth East and West, distant 3. leagues.

Capell Island and the Island of Ballecutin, lye West South-west, and East North-east, and are distant 3. leagues and a halfe.

Ballecutin and Corke Haven, lye West by South, and East by North, and are distant 3. leagues and a halfe.

Oyster Haven and the Old-head of Kinsale, lye Southwest and North-east, distant 3. leagues and a halfe.

The Haven of Kinsale lyeth from the Old-head, North north-east, and going in, you must keepe Bane Castle open off the West land.

The Old-head and Cape Cleare, lye West by South, and East by North, and are distant 14. leagues.

Cape Cleare and Silly, lye East Southeast, and West north-west, distant 50. leagues.

There lyeth from Fasten a Haven called Crocke Haven, and is from it North-west, distant 4. leagues.

There is a Haven called Scoll Haven, which lyeth from Fasten North and by West, distant 5. leagues.

There is a head-land, halfe way betwixt the Old-head of Kinsale and Baltemore, which is called Kendonetedo, and it lyeth North-west by West, from it is a good Haven called Clendor, there is a high land to the Eastward, you must goe aboard that high land, and so into the Haven. There is a ranie of Rockes on the West land, that goeth to the Eastwards, therefore keepe the East side, and when you come in, Anker before the Castle: there lyeth West north-west from the said head, a good Haven called Castle-haven, 4. leagues from it, and if you come out into the Sea
and

The Sea-mans Kalender.

and meete with the Stagges, you must goe **Portheast** into Castle-hauen, and in the entry ther is an **Iland** which you must leave on the **East** side of you, and another flat **Iland** which you must leave on the **West** side of you: you may goe dry at low water from it to the maine, for it is very nigh to the **West** land, but be bold on the **East** **Iland**, and goe right with a **Chappell** that lyeth on the **East** side of the maine **Land**, and when you are thwart of the **Chappell**, you shall see a **Castle** of the **West** side, and thwart of the **Castle** you may enter in 12 fatham, it is from the Staggs three and a halfe leagues.

You must understand, that the flood shoots from **Dourze** to the **Old-head** of **Kinsale** **Port** north east, and the ebbe to the contrary, and from the **Old-head** to the **Tower** of **Waterford**, **Port** east and **Southwest**, and from the **Dourze** to the northwards **Port** north east and **South** south west.

If you will goe in betwixt the **Cash** and the **North-head** of the grounds into **Dalky**, you must bring a round hill that stands like a **Sugar-loafe** **Port** north west, and then you shall haue 10 fatham: It floweth **Southeast** alongst the **Channell** and the barre of **Poulbacke**, there is eight fote water vpon it at low water, and three fatham at full **Sea**: your **Barre** lyeth **South** and **Port**, and you shall haue in the roade of **Poulbacke**, 14 fote at low water.

To sayle from **Dalky** to the **Road** of **Poulbacke**, you must keepe a small **Rocke** open, a handspicke length, and when you come to the **Barre**, you must lye **West** south west vp into the rode within the **Beacon**: then must you **Anchoz** in **four** fatham at high water, for there be two **Hilles** on the **Southside**, a high **Hill**, and a low round **Hill**: bring them both in one, and then you be in the best of the **Rode**. A **South** **Southeast** **Downe**, makes a full **Sea**.

A Note



A Note for going into
Milford.

If you come for Milford, you must leaue all the I-lands to the westwards, and when you haue the Grasham North Northwest, then the Hauen beareth Northeast by North, and when you come into Dall Rode, you may ride in three fatham and a halfe at low water, it floweth East by North.

Milford goeth in close vnder Cowein and Scabon, to the Eastward, and when you come open of Milford, you shall see an Island like the Mawstone, which lyeth on the East side, and in Dall Rode you may ride for all winds, the Small lyeth from the Grasham three leagues, and betwixt them lyeth a ledge of Rocks, which is dry at low water: it lyeth midway, it is very dangerous coming betwene them.

A Gene-

The Sea-mans Kalender.

A Generall and Compendious Tide-table,
 shewing what Moone makes full Sea or
 high Water, in all these places
 following.

Full Sea on the Coasts of *Zutphen, Friezland*
Holland, Zealand, and
Norway.

A t the Iutlandish Isles be- fore the Rivers of Heuer, Eider and Elbe,	S. and N.	land, Wyering, and Amster- dam,	S. W.
A t Ancuifen,	S. and N.	Without the bankes of Flan- ders,	S. W.
T he Ile of Vrke before Delfe Ile, at Emden, and all the shores of Flanders	S. and N.	D odrecht and Ziericke Sea,	S. W.
B efore the Maers deepe.	E. and W.	R otterdam, and from Harlem to the River of Maes,	S. W.
A t Hambrow and Antwerp,	E. and W.	A t Ward-house,	E. and W.
U nderneath Holyland,	W. S. W.	A t Brihac,	E. S. E.
A t Egmount and Harlem,	S. E.	C ape Gallant,	S. by E.
I n the Brelond and Vourd,	W. S. W.	T he Havens of Yotland and Norway,	S. and N.
B efore the Easterne and We- sterne entrances of the Emes or River of Emden, before all the Coast of Friezland, and the Flye.	E. S. E.	A t Corpus Christi point,	S. S. W.
B efore the Ghest of Texell,	W. S. W.	B efore the Een in the channell at Horn, Edam, Ile of Gore, before the Maes, before Can- fer and Teruer,	S. S. W.
U pon the flats of west Friez-		B efore the Willing and all the Coast of Zealand,	S. S. W.
		N orth Cape and Blangbrow,	S. W.
		F oxe-nose, and Saint Nicolas Roade,	W. S. W.
			Full

The Sea-mans Kalender.

Full Sea on the Coast of *France*,
Spaine and *Portugal*.

At Blacknesse, Armuty,
Rammekins, and Camfer,
S.S.W.

Within the Fosse of Caen,
S.S.E.

At Boleine, Calice, Grauelin, and
Dunkerke, halfe tyde, S. & N.

The Island of Bassé, S.E.

Within the Seyne, before the
Caskets, before Garnesey,
S.E.

Before Cherborough and the
Rase of Blanquet, S. and N.

At Newport halfe tyde, S. and N.

At Seyne head, s.s.W.

At Garnesey, and before Saint
Poul, W.b.S.

Bellisle and Holly Ile, w.b.s.

Without Vshant, and before
Burdeaux, E. and W.

Brittaine, Penmarke, Poytou,
and Gascoine, S.W.

Rase of Fountnes, S.W.b.W.

Bloy, and S. Mathews, W.s.W.

Abrouarth, and St. Malowes,
W.b.S.

Before the Killiars, S.W.

Portuise, and before the River
of Burdeaux, s.w.

From the Rase to the Pole-
head, S.W.

Before the River of Nantys and
before the Bay, s. W.

In the Bay within Vshant,
W.S.W.

At the Sept Iles, and at Calice
in the Creeke, w.S.w.

Within the River of Roan, and
from the Polehead of Burde-
aux, to the Forland of Foun-
taines; before Brouage, in the
river within all the Hauens
aforesaid, it floweth, s.w.b.w.

At S. Iohn de Luze, S.s.E

At Concalo, and Saint Malo,
E. and w.

At Caps Saint Maries, S.E.b.E,

On all the coast of Biskay, Ga-
lizia, Portugall, and Spaine,
it floweth Southwest and
northeast.

Scotland.

In S. Magnes found, s.E.b.E.

At Faire Iles, S.E,

In the Frith, S.S.E.

Faire Ile Rodes, S.b.E.

At Orkney, S.E.

England.

At Barwick it floweth s.s.w

At the Staples halfe tyde,
N.E.b.E.

At Huncliffe foote, halfe tyde,
N.E.b.E.

At

The Sea-mans Kalender.

At Flambrow-head	quarter	Betweene Bridlington & Law-	
tyde,	E.N.E.	renas,	W.s.w.
At the Shoo,	S.and N.	Betweene Lawrenas and Cro-	
At Tiamouth	quarter tyde,	mer along the Well, halfe	
	S.W.	tide,	E.and w.
At the Sporne,	W.b.S.	Betweene Cromer & Yarmouth	
Newcastle and Humber,	W.b.S.	roade,	s.E.
Winterton,	E.S.E.	Betweene Laitow roade and	
Blacke-tayle and the Nowre,		Orfordnesse,	s.E.b.s.
	S.b. W.	Betweene Orford and Orwell	
Blackney and the Shields,	E. & w	waues,	s.s.E
Yarmouth,	s.E.b.E.	Betweene the Naze and the	
Orford and Albrow,	s.E.b.s.	Warre-head of Colne,	s.b.E.
Whitbay and Robin-hoods bay.		At the West end of the Nore,	
	s.w.		s.b.w.
Before Hartlepole,	s.w.	Rocheſter and Maldon,	s.b.w.
Scarbrow quarter Tyde,		At Graueſend.	s.s.w.
	w. s.w.	London and the middeſt of the	
Hull and Lin halfe tide,	E. & w.	Heads or Straights,	s.w.
Before Humbers mouth,	N.w.	At the north Forlands,	s.s.E
At Burnham quarter tide,		At Beachy,	s.and N.
	E. and w.	Seuen Cliffeſ,	s.E.
Cromer,	S.E.	In the Downes,	s.s.E.
At Liſtow quarter tide,	s.s.E.	In the Chamber and at Gore-	
Harwich and Douer,	s.s.E.	end,	s.b.E.
Harwich within,	s.b.E.	At Camberneſ & at the Needles,	
South Forland,	s.s.E.		s.E.b.s
Before Margate and Thames		In Camberneſ roade,	s.s.E.
mouth,	s.b.E.	Portſmouth, Hampton and the	
Leigh and Kentiſhknock,	s. & N.	Ile of Wight,	s.and N.
Spits and along the Swine,		In the Oſing from the North	
	s.and N.	Forland to the South For-	
Betweene Tinmouth and Flam-		land, it runneth halfe tide;	
brow-head.	s.w.	and from the South Forland	
Betweene Flamborow-head and		to the Naſſe, it runneth halfe	
Bridlington-bay.	S.w.b.w.	tide, and halfe quarter tide,	
		and	

The Sea-mans Kalender.

and from the Nasse to Fairly
halfe tyde, and from Fairely
to Beachy quarter tyde vnder
other.

At Portland rode, E S.E.

At S. Ellens, S.E.b.E.

Within the Race of Portland, at
Poole in the Haven, at Home-
head, and thwart of Plymouth
and Dartmouth. S.E.

At Waymouth, E. and W.

At Farnmouth, Foy, Fournes, Pli-
mouth and Dartmouth. W.b.s

Bristow and Foulnes. E.b.S.

At the Start, E.b.S.

Moshole, W.s.w.

S. Davids head, E. and W.

Milford-häuen, E.s.E.

Ile of Man and Catnes, s.E.

Three leagues off the shoze, at
the Lizard to the shoze, and to
the Lands-end, E. s.E.

Within Torbay and in the Bay
of Carnaruen, W.b.s.

At the mouth of Seuerne, W.b.s

At the Moonles, W.b.s.

From the Lizard to the Sorlings
W.b.s.

Before Silly in the Channell, E.
and west.

At Silly halfe tyde, s.s.w.

Within Mounts Bay, and in the

Sea of Wales and Seuerne,
W.s.w.

At Lundy and the Holmes of
Bristow, E. and w.

In the Sleeue betwene Silly and
Vshant, S. and North.

Note that the floud sets in at
the East end of Wight till a
Southeast Moone: in the
roade of Dungenesse South
Southeast, but without in the
Channell a southwest Moone
full Sea: from the Seames,
and in the broad sound be-
twene it and Vshant, the
floud runneth East North-
east, and West southwest.

Ireland.

At Caldy, W.b.s.
Waterford and Abermo-
ricke, E. and w.

At Cape-cleere, E.s.E.

Macknells Castle, s.E.b.E.

Dublin and Lambay, s.E.b.E.

Dunbar and Kildien, s.E.

Dungarum, Kinsale, Corke. Ha-
uen and Baltemore. W.s.w.

The

The Sea-mans Kalender.

*The Course of all the Coasts of Holland,
Zealand, France, and Spaine, vpon what
point, and in what distance they are.*

From the Ile of Texell vnto Egmont.	S. & b. W. l. 5.
From Egmont vnto the Maze,	S. S. W. l. 11.
From the Maze vnto the Wieling.	S. W. l. 12.
From the Wieling vnto the head of straight betwene Douer and Calice.	W. S. W. l. 18.
From the Ile of Walkeren or Flushing vnto Calice,	S. w. & by w. l. 22.
From Blackenesse vnto Deepe,	S. S. W. l. 12.
From Deepe vnto Seyne-head, or the river of Seyne,	w. s. w. l. 11
From Seyne-head to the River of Cane,	S. w. l. 8.
From thence vnto Cape de la Hague,	N. w. l. 12.
From thence vnto the Caskets,	W. & by N. l. 8.
From the Caskets to Garnesey,	S. W. & by w. l. 4.
From Garnesey to St. Malo,	S. S. E. l. 10.
From Garnesey to the Sept Iles,	S. W. & b. s. l. 12
From the seauen Iles to St. Poul,	w. s. w. l. 8.
From thence to the Fourné,	w. s. w. l. 30.
From the Caskets to the Fourné,	S. w. & b. w. l. 34.
From the Fourné to St. Mathewes point,	S. s. E. l. 3.
From thence to Fontenau or Fontaines,	S. & by E. l. 5.
From Vihant to the Seames, aboard it,	S. l. 7.
From Fontenau to the west Penmarkes,	S. E. l. 7.
From thence vnto the Ile of Croy,	E. & b. S. l. 12.
From the west Penmarkes, to Bell Ile,	E. s. E. l. 15.
From thence to Hays somewhat more Easterly,	S. E. l. 12.
From thence againe untill within Piquilier,	E. & b. s. l. 10.
From thence againe vnto Croyfill,	E. & by s. l. 9.
From Piquilier vnto Heys,	E. & b. w. l. 5.
From Heys to the Killiats,	E. s. E. l. 10.
From the Ile of Heys to Porthuis,	S. E. & b. E. l. 12.
From	

The Sea-mans Kalender.

From S. Martins Island to the burning Ile,	S.E. & b.E. 1.3.
From the Burning Ile to the Oyster banks,	S.S.E. 1.3.
From S. Martins Ile to the Tower of Cordam,	S. & E. 1.12.
From thence to Bayone,	S. & N. 1.28.
From Baynone to Orio,	W.S.W. 1.5.
From Orio unto S. John de Luz,	E.S.E. 1.6.
From Orio unto S. Andrew,	W. & b.S. 1.20.
From S. Andrew to Cape de Pennas,	E. & W. 1.30.
From Cape de Pennas to Ribadeo,	S.W. & b.W. 1.12.
From Cape de pennas to Ortegall,	W. & b.W. 1.20.
From Ortegall unto Ribadeo,	E. 1.14.
From Ortegall unto the Ile of Cizaega,	S. & b.W. 1.13.
From Cizaega unto Coronna,	E.S.E. 1.6.
From thence unto Cape Coriana,	W.S.W. 1.10.
From Coriana to Cape Finisterre,	S. & N. 1.3.
From Finisterre unto Bayone,	S.E. & b.S. 1.14.
From Bayone unto Port de Port,	S. S.E. 1.18.
From Port de Port to Aueiro,	S. & N. 1.8.
From Aueiro to Montega,	S.S.W. 1.5.
From Montega unto Barlings,	S.W. 1.12.
From Barlings unto Roxende,	S. & b.E. 1.12.
From Roxende to S. Viues point,	S.E. & b.S. 1.8.
From thence unto Cape of S. Vincent.	S. & N. 1.24.
From thence unto Pharo,	E. & W. 1.14.
From Pharo unto Lepe,	N.E. & b.E. 1.2.
From Pharo unto Saltees,	E.N.E. 1.18.
From Saltees to Chipiona,	S.E. 1.8.
From Chipiona to Calis Malis,	S.E. 1.6.
From Calis unto the Strait of Gibraltar,	S.E. 1.8.
From Calis unto Cape de Cantin,	S.W. & b.S. 1.60.
From Cape de Cantin, to the Ile of Madera,	W. 1.140.
From Cape S. Vincent to Madera,	S.W. & b.W. 1.100.
From Roxende to Madera,	S.W. 1.130.
From Roxende to the Ile of Tercera,	W. 1.20.

The Sea-mans Kalender.

The Courses of *England, Ireland,*
and *Scotland.*

From Boecknes unto Leeth in Scotland,	S.S.W. l. 18.
From Leeth unto Barwicke,	S.S.E. 18.
From Barwicke unto the Holy Ile,	E.S.E. l. 4.
From S. Abbes-head to the Easterne end of Farne Isles,	S.E. l. 6.
From the Isles of Farne to the Tees mouth,	S.S.E. l. 14.
From the River of Tees to Flambrow-head,	S.E. & b.S. l. 14.
From Flambrow-head to Blackney,	S.E. l. 18.
From Blackney unto Winterton,	S.E. l. 8.
From Winterton unto Lestoff,	S. & b.E. l. 8.
From Lestoff unto Orford Haven,	S. l. 7.
From Orford unto the Foreland,	S.S.E. l. 13.
From the Foreland to Douer,	S. l. 7.
From Douer to the Shingles, or the Nesse point,	S.W. & b.W. l. 7.
From the Nesse point unto the Beache,	W.S. W. l. 10.
From the Beache to the Ile of Wight,	W. & b.S. l. 15.
From Wight unto Portland,	W. & b.S. l. 10.
From Portland unto the Start point,	W.S.W. l. 14.
From the Start unto Ramhead point,	W.N.W. l. 6.
From Ramhead unto the Dodmans point.	W.S.W. l. 8.
From Dodmans to the Lizard point,	S.W. & b.W. l. 6.
From the Lizard to the Isles of Silly,	W. l. 12.
From the Lizard to the Lands-end,	W.N.W. l. 8.
From the Lands-end to the Ile of Lundy,	N.E. l. 14.
From thence unto the Holmes of Bristow,	N.E. & b.E. l. 16.
From thence unto the Ile of Caldie,	W.S.W. l. 25.
From thence to the Isles of Salteys, on the Coasts of Ireland,	W.N.W. l. 10.
From Salteys to Cape Cleere,	W.S.W. l. 25.
From Cape-Cleere to the Ile of Dorsey,	W. l. 12.
From the point of Dorsey to the Ile of Blakem,	N.N.W. l. 16.
From Blakem unto the Isles of Arrant,	N.N.E. l. 14.
From the Isles of Arrant to Galwicke, or the Galfe in Ireland,	E.N.E. l. 6.

Of

The Sea-mans Kalender.

Of diuers and sundry Courses ouer the Westerne Sea.

From Texell on the Coast of Holland to Flamborow,	W.N. W. 1.45.
From Texell vnto Winterton in Norfolke,	W. 1.32.
From the Ile of Texell vnto Lestoffe,	W. & b.S. 1.38.
From the River of the Maze in South Holland, vnto Harwich.	W. 1.16.
From the said Maze to the Foreland of England, W. & b.S. 1.25.	
From the Marsdeepe in North Holland, to the said Foreland,	S.W. 1.36.
From the said Marsdeepe to Calice,	W. & b.S. 1.38.
From Douer vnto Boloigne,	S.E. 1.8.
From Boloigne vnto the Beache,	W. 1.16.
From the Beache to Diepe in Normandy,	S.E. 1.18.
From Diepe vnto the Ile of Wight,	E.S. E. 1.28.
From Wight to the Seyne-head or mouth,	S.E. 1.30.
From the said River of Seyne to Portland,	W.N.W. 1.30.
From the Ile of Wight vnto the Caskets,	S.W. & b.S. 1.14.
From Garnesey vnto S. Malo in Normandy,	S.S.E. 1.8.
From the Caskets to Portland,	N.b.W. 1.10.
From the Caskets to the Start point,	W.N.W. 1.16.
From the Start to the Sept-Iles in Normandy,	S.S.E. 1.24.
From the Start to S. Poul in Normandy,	S. & b.W. 1.22.
From S. Poul to Portland,	N.E. & b.N. 1.32.
From the Fournes to Ram-head,	N.N.E. 1.28.
From the Start point vnto Vshant,	S.W. & b.S. 1.32.
From the Fournes to the Lizard,	S. & N. 1.22.
From Vshant to the Isles of Silly,	N.N.W. 1.26.
From the Sorlings to Milford Haven,	N. & b.E. 1.15.
From the Sorlings to Wexford in Ireland,	N.N.W. 1.34.
From the Sorlings to Cape-Cleere,	N.W. 1.24.
From Cape-Cleere to Cape de Finisterre,	S.E.N.W. 1.30.
From the Lizard to Cape de Finisterre in Galicia,	S.S.W. 1.12.

The Sea-mans Kalender.

From Vshant unto the Ile of Cizarga in Galizia,	S.S.W. l. 58.
From Vshant to Laredo in Biscay,	S.S.E. l. 58.
From the Seame Rockes to S. Sebastian in Biscay, Southeast and by S. l. 10.	
From Vshant againe to Cape de Pannas in Biscay,	S. & N. l. 70.
From Belile unto Ortegall in Galizia,	S. W. l. 75.
From S. Martins Ile to Ortegall,	W. S. W. l. 85.
From Ortegall to Cape de Coriana,	S. W. & b. W. l. 14.
From Cape de Finisterre to the Isles S. Michael,	W. S. W. l. 185.
From S. Michael to the Ile of Tercera,	N. W. l. 136.
From Cape de Finisterre to the Ile of Madera, Southwest, & by W. l. 190.	
From Madera unto the great Ile of Canary,	S. E. b. E. l. 60.
From Cape de Finisterre to Bayone in Galizia,	S. & b. E. l. 15.
From Cape de Finisterre to the Ile of Barlings,	S. & N. l. 50.
From the Barlings in Portugall to the Ile Canary,	S. S. W. l. 170.
From the Ile of Madera to Calis malis,	E. N. E. l. 150.
From Calis to Cape de Cantin,	S. W. & b. S. l. 65.
From Cape de S. Vincent unto Cape Cantin,	S. & N. l. 62.
From Cape de S. Vincent unto the Ile of Madera, Southwest, & b. W. l. 120.	
From Roxen in Portugall to the Ile of Tercera.	E. & W. l. 210.

The Courses of Norway, Swethland, and East Finland.

From Schuytenes to the Westeen,	S. & b. E. l. 4.
From Westeen or Wostone to the Iedder,	S. S. E. l. 4.
From the Iedder to the Worsteen or Forstone,	S. E. l. 5.
From the Forstone to the Noes,	E. S. E. l. 6.
From the Noes unto Reperwicke,	E. N. E. l. 8.
From Reperwicke to Mardon,	N. E. l. 10.
From Mardon unto Iofferland,	N. E. l. 8.
From Iofferland unto Langhesondt,	N. N. E. l. 21.
From Langhesondt to Ferderoer,	N. E. & b. E. l. 6.
From	

The Sea-mans Kalender.

From Ferderoer vnto Soen-water,	N.1.6.
From Ferderoer vnto Roeghe,	N.N.E.1.4.
From Ferderoer vnto Akerfoud,	E. N.E.1.6.
From Akerfoud to Maesterland,	S.E. & b.E.1.4.
From Pater noster to Nydrinke,	S.E.1.8.
From Nydrinke to VVaerberghe,	S.E. & b.E.1.4.
From Waerberghe to Swedoroer,	S. S.E.1.6.
From Swedoroer vnto Col,	S.S.W.1.3.
From Col vnto Lapsland,	S.E.1.3.
From Lapsland vnto Ween,	S.S.E.1.2.
From Ween to Drakeriffe,	S. & b.E.1.7.
From Drakeriffe to Steden,	S. & b.W.1.4.
From Steden to the North end of Bornholme,	E. & b.N.1.15.
From Bornholme vnto Anno.	N. & b.W.1.8.
From Anno vnto the Rockes,	N. E.1.8.
From the Rockes vntill within the Calmerfoud,	N. N.E.1.10.
From Calmerfoud to the Sweedish Ionckfrow,	N. N. E.1.8.
From Ionckfrow to Landfoort,	N.N.E.1.8.
From thence vntill befoze Dury-hauen,	N.E. & b.E.1.8.
From the Stockhomes Shares to View of Abo,	N. E. & b.N.1.24.
From View vnto Luns Vtschares,	E.N.E.1.28.
From the Vtschares to the Ile Putfuagto,	E. & b.N.1.30.
From thence vnto Somere,	E. & W.1.9.
From Somere to the Rod-hole of Wiburgh.	N.E.1.9.
From the Rep-hole to Traelsand,	N. E. & b.N.1.2.
From thence vnto Wiburgh,	leagues 2.

**The Depth and Soundings, neere diuers
Prouinces. And first, of Gascoigne;
Poictou, and Britaine.**

VVithout the Riuer of Burdeaux, there is 14. fatham
depth, but when you come within the sight of Cordam
Tower, 30. fatham.

Ouer against the Coast of Poictou, 16. leagues without Ole-
ron, you haue 36. fatham, but comming neere the land 8. leagues
from the shore, you haue 35. fatham: In the Channell betwene
Porthuis and Heys, it is 30. fatham, and as much in the channell
of Heys: as also betwene Heys and Belile without the channell
is 35. fatham, but within 25. without Heys, two kennings off,
there is a sound 45. fatham.

Twenty two leagues Southward off Belile, is 70. fatham,
but 9. leagues from the Northwest point of that Island, towards
the Southwest is 60. fatham: and ouer against the midst of Be-
lile, in 40. fatham depth, you shall see Land. In your course be-
twene Belile and the Seames, you may come no nearer then 50.
or 45. fatham, if you sayle from Belile West and by North: when
you are against Gloyland, you shall finde 60. fatham depth, with-
out and within the Rocke, which stands off Gloyland to the
Seawards, you haue 40. fatham water: in 60. fatham depth
without the west Penmarkes, you may sayle Northwest by West
without the Seames, but by night come no nearer then in 55. fa-
tham, for the ground is grosse and red sand full of red flints:
halfe a league west southwest off the Seames, is a ledge of Rocks,
where you haue 7. fatham depth, but betwene the Seames, and
the Rocke is 50. fatham.

In the Channell betwene the Seames and Vshant, is 55. fa-
tham depth, the ground is grosse and red sand, with little round
stones red and blacke: neere to Vshant is 45. fatham, but within
it is of a variable depth: Southwest almost 6. leagues off Vshant,
you

The Sea-mans Kalender.

you haue 70. fatham, and the ground is fine white sand, with little white shelles, and other small things like needles, and then is Vshant East from you: but if the sand be grosse and white, mingled with great and white shelles, then it is Southeast to you: but if you doubt of these grounds, goe Southwesterly, if your sound be deeper, then are you towards the Seames, but if not so deepe, then are you in the Channell almost South off Vshant.

Betwene Vshant and Obueracke, in the trade, it is 60. fatham depth: betwene Vshant and the Sorlings in the middelt of the Channell there is 70. fatham: betwene the Seames and Vshant in 70. fatham water, the ground is of little blacke stones easie to be broken and of yellow earth and clay: but if you finde red and hard sand, goe Southward till you happen on white sand, mingled with long stroakes, and then you are in the Channell.

If from Cizarga you sayle South northeast, in the Spanish Seas toward Vshant, and finde your selfe in 80. fatham, you are 14. or 15. leagues off Vshant, but comming nere you shall haue 70. fatham water, and be 10. leagues from Vshant: but if you find the ground to be yellow shelles, and little blacke stones, then are you towards the Seames, therefore you must with the tyde beare off Southward to shun Vshant, untill you finde white sand, and things like needles, for such are the grounds of the Channell.

Betwene Vshant and the Ile of Base, when you sayle at foure fatham water, you are 4. leagues off the shoze, but by night come no nêrer then 25. fatham: When you are two leagues off Obueracke, you shall finde 25. fatham depth, 8. leagues off the Sept Ilands, you haue 55. fatham.

A league without the Rockes of Obueracke, there is a blinde or hidden Rock, so that if you are to sayle vpon aboord betwene the Fournes and Obueracke, come no nêrer the blind Rocke then 40. fatham, but Eastward you may sayle in 30. or 25. fatham.

If a Ship sayling west, S. W. and South west by W. off Silly at 80. fatham water to be found to be vnder 40. degrees 25. min. of Altitude, she is 26. leagues from Land, and must goe East and by South till shee get 66. fatham water, for then shee is in the Channell betwene Silly and Vshant, and then if she be bound for

The Sea-mans Kalender.

England, the must sayle more Northward, and betwæen the Lands end and the Lizard the shall haue 55. fatham depth.

The soundings and grounds betweene *Ireland*,
England, and *Normandy*.

Three Leagues without the Isles of Dorsey neere Ireland, it is 45. fatham deepe: in the Channell betwæene Dorsey and Cape-cleare is 42. or 43. fatham, the Channell from Cape-cleare to Saltees hath 45. fatham, but 2. Leagues off Ireland it hath but forty: betwæene Saltees and Milford it is 44. fatham deepe, and betwæene Lundy and Silly 38. fatham: In the mid-way betwæene Silly and Milford is 44. but North of Silly 40. and 42. and neere England by the Lands end, the Channell is of 50. fatham deepe.

Comming from Cape Finister, sayling N. N. E. if you haue 80. fatham, you are 20. Leagues off the Shore, and the ground is small blacke Stones with great red Sand: In the same course, when you haue but 60. fatham, you are within 12. or 14. leagues of the Shore, but shall not so soone kenne land as you thinke for: you shall a great while haue 60. fatham: being at the N. parts of the Channell about Silly, betwæene Vshant and Silly, the Channell is 70. fatham: on the S. side of Silly, the ground is small red Stones, and fine white Sand: Duer against the Lizard and Falmouth 4. Leagues from Shore, is 52. fatham: betwixt Foy and Plimouth sound, in the Channell highest, is 60. fatham, betwæene the Lizard and the Start, beare no neerer the Shore then 35. fatham, you may cast anker in the trade or Channell in 25. fatham, and so you shall lye within the Foreland Stream: betwæene Plimouth and the Sept-Iles in the middelt of the Channell is 55. fatham, but 4. leagues S. S. W. off Plimouth is but 35. fatham: S. S. E. of the midland of the Start, is 45. fatham but from thence 5. or 6. leagues S. E. is 54. fatham: in the Channell betwæene the Caskets and Portland is 40. fatham, and a league N. of the Ile of Aldernay is a hole or pit 80. fatham deepe: all the rest of the channell betwæene Portland and Aldernay, is of equall depth, viz. 40. fatham:

The Sea-mans Kalender.

fathom : when you are within kenning of Portland, your sounding is 34. fathom : and 2. leagues off Wight, 36. fathom : also 2. leagues Eastward of Beachy, betwene Picardy and Wight, the Channell in the midst is 38. fathom : between Winchelsey and Picardy 24. fathom, the shoals betweene the heads called the Vrowensland, hath but 3. fathom and a halfe, but on the South side of it, is 24. fathom : and in all the faire way betwene Zealand and Douer, it is 24. fathom deepe.

Depths of the North Sea from the Foreland.

In the Channell from England, Foreland, and Sands of Flaunders, you haue 24. fathom deepe : but 3. leagues N.W. by W. of the Countrey of Zietrickz : called Botbrecke, it hath but foure fathom depth without the shoald : the channell of Zeland is 26. fathom : N.W. off Harlem, 8. or 9. miles within the Sea, there beginneth a shelve called Debreede Verthien, reaching alongst the Coast of Holland to the plaine of Ameland, where it endeth : ouer against Harlem and Egmont, is 13. 14. or 15. fathom, and the ground is full of Dase, mingled with blacke sand like mustards seede : the said shelve hath 15. 16. or 17. fathom depth : betweene Texell and Vlyeland, where the ground is grosse red sand, 6. or 7. leagues from the shore, for there the shoald is narrower then it is towards the South end of the Channell : without the shoald betweene Zeland and Texell is 26. fathom deepe, as farre as the shoald which the Fishers call Dog-sand. In the Channell on Englands side, ouer against Yarmouth, is 35. fathom, but against Flamborough and Scarborough point 38. fathom, whereas the white shelve called Dog-sand beginneth, reaching into the North Seas to the channell of Helichland : this shoale (where it is within kenning of Flamborough point) hath but 9. or 10. fathom, but when in the same sand you find 12. fathom, then Texell is from you Southeast, almost 30. leagues, but when you are come to 16. fathom, then are you within 21. leagues S.W. of Vlyeland.

A Ship that comes from the Risse, finding 18. fathom depth

on.

The Sea-mans Kalender.

on the aforesaid land, is then 10. leagues South and by East off Vlyeland, but at 22. fatham, you must then sayle towards the Vlye. South and by West; and South south west, but if in the Channell of Helichland, 24. or 26. fatham bee found, then must you sayle South west, and South west by South, and then you come to the Schelling h: But if in Helichland sound you haue 27. fatham, then are you altogether to the Eastward off it: betwene the Riffe and the Doggerland, the Channell is 26. fatham without the Channell Westward, it is 32. fatham deepe.

A Ship that comes out of the English Straights, or out of Zealand, hauing at the Riffe 24. fatham, is from the Naes in Norway, 18. leagues North and by East, but hauing 20. fatham, is but 16. leagues from it North: and finding but 18. fatham, is then 18. leagues off it North by West: The course from thence to the Holmes, is 12. leagues North by East: From thence to the point of Scackghens, 18. leagues North east by East, there is a Roocke of one fatham depth, North east, and North east by East off the Holmes, two leagues from shore.

Depths neere Iutland and Ameland.

In the Sea without Iutland, a myle from Dodenberg, is a Banke called Reepe-horne, stretching out 8. leagues West by South in some places but 3. fatham deepe, and in some places may be sayled ouer, and become a Roade for a North west and a North wind in 20. fatham: From Ameland towards the Sea, the ground is grosse sand, red and blacke, mingled with shelles: thence Southwards in 16. fath. sayling 3. houres, you shall come to the smooth Sea of Ameland, where the ground is fine sand, with shelles: North front Schelling, in 24. fatham, is fine white sand, and in 8. fatham, white and blacke sand mingled. Vlyeland hath white sand with shelles, and thin blacke sand in 16. fatham depth: From the West end of Vlyeland, is great and red sand mingled with blacke like unto Mustard seed: about six or seauen leagues from shore, at the East end off Schelling to Seawards, at 18. fatham, is fine white sand mingled with blacke, haning
in

The Sea-mans Kalender.

In it things like needles. Daer against Borke in the Westerne Emes 17. 02 18. fatham depth, land may be seene: the ground is grosse grauelly sand: at 14. fatham may Ameland bee kend, but Schellingh at 16. and Vlyeland at 15. 02 16. fatham water. At the North Hooke of Texell, Land may be seene at 16. fatham. Holland at 14. 02 15. When you sayle within the shoald called the Breduirthien, which beginneth Northwest of Harlem, and stretcheth alongst the Coast of Holland, to the West end of Vlyeland, it is 7. 02 8. leagues from the shore.

Soundings and Grounds neere the Schaw.

A Great league West by North from the Schaw, is 35. fatham depth: North northeast a great league off the Corner of this Point is 38. fatham, and when the Point is North-east from you, then you haue 17. fatham. Betweene this point and Leson, the Channell is 20. fatham deepe, and the ground like clay or dirt: betwixt Anhout and Waersbergh, in the midst of the Channell is 22. fatham water: betweene Leson and Anhout, the ground is fine and stony: neere Waersbergh, is a shoald of 17. fatham depth: betweene Anhout and Coll, is another shoald of 17. fatham, where some time it is troublesome like a Whirle-pole.

Depths of the Easterne Seas.

Betweene Oeland and Gothland, the soundings are vnequall, sometimes of 20. sometimes of 23. fatham, the ground grosse and blacke stony sand, like Pease: when the South end of Oeland is 2. leagues from you Westwards, you haue 27. fatham, where also you may gage water: but when the Chappell of Sudernoor-den beareth West Northwest off you, then haue you 31. fatham, and ground fit to gage water: Duer against the Roocke in the faire way is 52. fatham, and a clay ground, but fit for gaging: betweene the greater and lesser Carta is 14. fatham, vnder which is safe roade for Ships, there is a shoald betweene Houborg and Ostergard,

The Sea-mans Kalender.

Ostergard, 4. fatham depth, the ground great red sand, but hardly from thence can you ken Gothland out of the top: there is also to the Eastward another shoald of 36. fatham, which when you are past, you haue moze then 40. fatham water: when the point of Righ is thre leagues Southeast from you, then haue you 30. fatham: but when it is from you halfe a league South Southeast, you haue but 15. fatham, the ground is white sand: but when it beareth West a small league from you, then you shall find 16. fatham ouer against Heel, halfe a league from the shoze it is almost 3. fatham deepe: the rode for ships at Heel, hath 25. fatham depth: betwene Moan and Falsterborne is 14. fatham depth: betwene Stead and Falsterborne, in the very Channell is but 22. fatham deepe: nere Falsterborne: it is full of shoaldes, but nere Stead you haue 13. fatham water: betwene Darkeriffe and Southolmen, which is moze sholdy, there is 5. fatham wanting two fote: From thence toward the Sound it is something deeper, 6. 7. 8. 9. or 10. fatham.

A Note of certaine and most dangerous places in the Sea.

The principall and most perilous of all, is the Mael-streame well or Slorp, called the Mouskstreame: which lyeth on the backside of Noirway in 68. degrees on the Northside of an Island or Roke called Weeray. This well draweth the water vnto it selfe during the whole flood (which is the space of 6. houres and 12. minuts) with such an indraught and force, and with such a noyse through the tumbling and falling of the waues & streames one vpon the other, that it is rather to wonder at then to write of. So that during that time, within the space of moze then two leagues round about that Roke (of Mouske) vnder which that water floweth) no Ship or other vessel may come nere, for they should to their vtter destruction be drawne into it and swallowed vp: but all the time of the Ebbe the water is so strongly cast vp againe, that no kinde of substance or Vessel, how heauy soeuer it be, can there sinke. So that our Northerne Fishers at that time

The Sea-mans Kalender.

time doe with their Tollen or Fishing Boates, take many and strange formed fishes, which they draw into their Boates with Hookes and lines, which they haue ready layd for that purpose: for that during the Ebbe, they cannot returne into the Gulph, nor get vnto the water.

The Northerne people that inhabite about those Rockes, doe thinke that streame passeth away vnderneath a part of Norway, vnder the North bottome in East Finland: because that in that place there is likewise such a Maelstreame, (though not altogether so strong nor dangerous) where the like fishes are taken: and the water is in like sort troublesome, as it is vnderneath, and about the Rocke of Mouske.

Whereupon, many experimented Pilots doe call the said Sloop, the Pauell of the Sea, which causeth the courses of the Ebbes and Floods about the Lands that are on this North side of the Equinotiall, as the most conuenient place for that purpose, to spread the waters South, and North, East and West: that is to say, Northerly towards the Pole Articke, South-easterly on the backe-side of Russia and Tartaria, towards the Streight of the great South Sea called Mar del Sur, wherein the Spirits Islands (called the Molluccas, nere the Equinotiall) are lying Southward to the North Sea of these Low Countries: As also on the backside of Scotland and Ireland, toward the Spanish and Atlanticke Seas, and towards the North-west beyond Iceland, towards Furbishes Straights, where it is thought the way vnto Cathay may be found.

There are mozeouer to be feared vpon the Westerne Seas, very dangerous streames and Gulphes, as in the Race of Portland, where oftentimes happeneth such turning and tumbling of waues and streames, that the Ships which passe that way, are many times in great perill.

Mozeouer the Race of Blanquert, betwene Normandy, and the Isles of Alderney, roareth and rageth so dangerously, that many Ships fall therein headlong, so deepe, that sodainely they are swallowed vp and sunke to the very bottome.

The Race of Fountney, is moze dangerous then all these, where

The Sea-mans Kalender,

in many small Vessels and Barks of Britanny And of other Counties, are suddenly deuoured and cast away: and the entrance of the Garrone, called the Riuer of Burdeaux, betweene the Towers of Cordam, and the Southerne and Northerne Alles, is likewise very perilous, and many Ships doe often perish there if the Pilots be not skilfull and well acquainted with the place.

And these aforesaid, being the most full of danger, it behooueth each Pilot or Master to haue especiall knowledge thereof, and great care to p[re]uent the danger that may ensue vnto them thereby.

**The yeares for which the Tables of the
Sunnes place and Declination
(following) serue.**

First.	Second.	Third.	Leape yeare.
1630	1630	1631	1632
1633	1634	1635	1636
1637	1638	1639	1640
1641	1642	1643	1644
1645	1646	1647	1648
1649	1650	1651	1652

Here-

Hereafter followeth a most excellent, necessary and compendious Kalender, shewing the Prime, Epact, Dominicall Letter, Leap-years and moueable Feasts, for 24. yeres; inclusiuely comprehending therewith the true day and houre of the Moones Coniunction or Change, for 19. yeares to come, with the true place of the Sunne, and his Declination from the Equinoctiall, both Northwards and Southwards vpon euery degree thereof, through the 12. Months of the year.

Year of our Lord	Prime.	Epact.	Letter.	Sunday	First Sunday in Lent.	Easter day.	Ascensi- on day.	Whit- sunday.	Trinity Sunday.
1629	15	15	D		Febr. 22	Aprill 5	May, 14	May, 24	May 31
1630	16	26	C		14	Marc. 28	6	16	23
1631	17	7	B		27	Apr. 10	19	29	Iune 5
1632	18	18	A	G	19	1	10	20	May 27
1633	19	29	F		Mar, 10.	21	30	Iune 9	Iune 16
1634	1	11	E		Febr. 23	6	15	May 25	1
1635	2	22	D		15	Marc. 29	7	17	May 24
1636	3	3	C	B	March. 6	April 16	25	Iune 4	Iune 11
1637	4	14	A		Febr. 26	9	18	May 28	4
1638	5	25	G		11	March 5	3	13	May 20
1639	6	6	F		March. 3	April 14	23	Iune 2	Iune 9
1640	7	17	E	D	Febr. 23	5	14	May 24	May 31
1641	8	28	C		March. 7	25	Iune, 3	Iune 13	Iune 20
1642	9	9	B		Febr. 27	10	May, 19	May 29	5
1643	10	20	A		19	2	11	21	May 28
1644	11	1	G	F	Marc. 10	21	30	9	16
1645	12	12	E		Febr. 23	Aprill 6	15	25	Iune 1
1646	13	23	D		15	Mar. 29	Aprill 7	17	May 24
1647	14	4	C		March 7	Apr. 18	27	Iune 6	Iune 13
1648	15	15	B	A	Febr. 20	2	11	21	May 28
1649	16	26	G		11	Marc. 25	Aprill, 3	May 13	20
1650	17	7	F		March 13	Apr. 14	23	Iune 3	Iune 9
1651	18	18	E		Febr. 16	Marc. 30	Aprill, 8	May 18	May 25
1652	19	29	D	C	March 8	Apr. 19	28	Iune 7	Iune 14

January hath 31. dayes.

The Prime.		Fast.	Leng. of the day.	True Place and Declination.									
				☉ in y ^e First yeare.					☉ in y ^e second yeare				
				H. M.	D. M. D. M.	D. M. D. M.	D. M. D. M.						
viii. 7.	1 A	New	7 52	1 21 38 21 47	1 21 23 21 49								
	2 B	yeares d.	7 54	2 22 39 21 37	2 22 24 21 39								
3. xvi.	3 C		7 58	3 23 40 21 27	3 23 26 21 29								
	4 D		8 0	4 24 41 21 16	4 24 27 21 18								
v. 8.	5 E	Fast.	8 3	5 25 43 21 5	5 25 28 21 17								
	6 F	Twelwe	8 6	6 26 44 20 53	6 26 29 20 56								
i. xiii.	7 G	day.	8 9	7 27 45 20 41	7 27 30 20 44								
ij. 10.	8 A	Lucian.	8 12	8 28 46 20 28	8 28 32 20 32								
x. 17.	9 B		8 15	9 29 47 20 16	9 29 33 20 19								
	10 C		8 18	10 30 49 20 3	10 30 34 20 5								
vxiiij. 3.	11 D		8 21	11 1 50 19 49	11 1 35 19 52								
vij. 4.	12 E		8 24	12 2 51 19 37	12 2 36 19 38								
	13 F	Hillary.	8 28	13 3 52 19 21	13 3 37 19 25								
2. xv.	14 G		8 32	14 4 53 19 7	14 4 38 19 10								
	15 A		8 36	15 5 54 18 52	15 5 39 18 55								
iiij. 2.	16 B		8 40	16 6 55 18 37	16 6 40 18 40								
xij. 11.	17 C		8 43	17 7 56 18 21	17 7 42 18 25								
ix. 5.	18 D		8 46	18 8 57 18 5	18 8 42 18 9								
6. j.	19 E		8 49	19 9 58 17 49	19 9 43 17 53								
	20 F	Fabian.	8 52	20 10 59 17 32	20 10 44 17 36								
	21 G	Agnes.	8 55	21 11 0 17 15	21 11 45 17 19								
6. xvij.	22 A	Vincent.	8 58	22 12 1 16 58	22 12 46 17 2								
	23 B		9 0	23 13 2 16 41	23 13 47 16 45								
vj.	24 C		9 2	24 14 3 16 23	24 14 48 16 27								
	25 D	Conuers.	9 4	25 15 4 16 5	25 15 49 16 9								
3. xiiij. 2. ij.	26 E	of Paul.	9 6	26 16 4 15 47	26 16 50 15 51								
ii. ij.	27 F		9 9	27 17 5 15 28	27 17 51 15 32								
5. xj. j.	28 G		9 12	28 18 6 15 9	28 18 52 15 13								
xix. 4.	29 A		9 15	29 19 7 14 50	29 19 52 14 55								
i. viij.	30 B		9 18	30 20 8 14 31	30 20 53 14 35								
	31 C		9 21	31 21 8 14 11	31 21 53 14 16								

South Declination.

January hath 31. dayes.

of the Sunne.

☉ in Ψ third year.

☉ in Ψ Leape year.

	D.	M.	D.	M.		D.	M.	D.	M.
1	21	9	21	51	1	20	54	21	54
2	22	10	21	41	2	21	55	21	44
3	23	12	21	31	3	22	56	21	34
4	24	13	21	21	4	23	57	21	24
5	25	14	21	10	5	24	59	21	15
6	26	15	20	59	6	25	59	21	2
7	27	16	20	47	7	27	00	20	50
8	28	18	20	35	8	28	2	20	38
9	29	19	20	22	9	29	3	20	25
10	∞	20	20	9	10	∞	4	20	12
11	1	21	19	57	11	1	5	19	59
12	2	22	19	42	12	2	6	19	46
13	3	23	19	28	13	3	7	19	32
14	4	24	19	14	14	4	8	19	18
15	5	25	18	59	15	5	9	19	3
16	6	26	18	44	16	6	10	18	48
17	7	27	18	28	17	7	11	18	33
18	8	28	18	13	18	8	12	18	17
19	9	29	17	57	19	9	13	18	1
20	10	30	17	40	20	10	14	17	44
21	11	31	17	23	21	11	15	17	28
22	12	32	17	6	22	12	16	71	11
23	13	33	16	49	23	13	17	16	53
24	14	34	16	31	24	14	18	16	36
25	15	35	16	13	25	15	19	16	18
26	16	36	15	55	26	16	19	16	0
27	17	37	15	36	27	17	20	15	43
28	18	37	15	18	28	18	21	15	23
29	19	38	14	59	29	19	24	15	4
30	20	39	14	40	30	20	23	14	45
31	21	39	14	20	31	21	24	14	25

South Declination.

Certaine of the most notable fixed Starres of the 1. 2. and 3. bignesse, their Magnitude, Declination, and right Ascension: whereby you may readily finde when any of them are in rule for obseruation.

1.

Whales taylor, is a starre of the third bignesse, whose Declination is 20. degr. 12. minutes South, and the right ascension thereof, is 24. minutes of an houre.

2.

Whales backe of the third bignesse, declination 12. degr. 20. minutes South, and right ascension 50. minutes.

3.

Rams home, is a starre of the third bignesse, whose declination is 17. degrees, 17. minutes North, and his right ascension is 1. houre 32. minutes.

4.

Rams head of the third bignesse, declination 21. degrees 33. minutes North, right ascension 1. houre 40. minutes.

D

February


February hath 28. dayes.

The Prime.			Leng. of the day.	True Place and Declination.										
				H. M.	☉ in ♊ First yeare.				☉ in ♊ second yeare.					
					D. M.	D. M.	D. M.	D. M.	D. M.	D. M.				
2. viij.	1	D	Fast.	9 30	1	23	9	13	51	1	22	55	13	56
7. xvj.	2	E	Purifica.	9 33	2	24	10	13	31	2	23	55	13	36
	3	F	of Mary.	9 37	3	25	11	13	9	3	24	56	13	15
v.	4	G		9 41	4	26	11	12	50	4	25	56	12	55
xij. 12.	5	A	Agathe.	9 45	5	27	12	12	29	5	26	57	13	34
	6	B		9 50	6	28	12	12	8	6	27	57	12	14
4. ij.	7	C		9 54	7	29	12	11	48	7	28	58	11	52
x.	8	D		9 58	8	×	13	11	26	8	29	58	11	31
	9	E		10 2	9	1	13	11	5	9	×	59	11	10
8. xvij.	10	F		10 6	10	2	14	10	43	10	1	59	10	49
3. vij.	11	G		10 9	11	3	14	10	21	11	2	59	10	27
	12	A		10 12	12	4	14	10	0	12	3	59	10	5
7. xv.	13	B		10 15	13	5	15	9	37	13	4	59	9	43
	14	C	Valent.	10 18	14	6	15	9	15	14	5	59	9	21
10. iij.	15	D		10 22	15	7	15	8	53	15	7	0	8	58
3. xij.	16	E		10 26	16	8	15	8	30	16	8	0	8	36
j. 6.	17	F		10 30	17	9	15	8	8	17	9	0	8	14
	18	G		10 34	18	10	15	7	45	18	10	0	7	51
5. ix.	19	A		10 38	19	11	16	7	22	19	11	0	7	28
xvij. 11.	20	B		10 42	20	12	16	6	59	20	12	0	7	5
	21	C		10 46	21	13	16	6	36	21	13	0	6	42
	22	D		10 50	22	14	16	6	13	22	14	0	6	19
3. vj.	23	E	Fast.	10 54	23	15	16	5	50	23	15	0	5	56
xij. 11.	24	F	Mathias	10 58	24	16	15	5	27	24	16	0	5	32
2. iij.	25	G		11 2	25	17	15	5	4	25	17	0	5	9
xj. 5.	26	A		11 7	26	18	15	4	40	26	18	0	4	46
	27	B		11 12	27	19	15	4	16	27	19	0	4	22
1. xix.	28	C		11 16	28	20	15	3	53	28	20	0	3	58
	29													


South Declination.

February.

of the Sunne.

☉ in  third yeare.

	D.	M.	D.	M.
1	22	40	14	0
2	23	41	13	40
3	24	41	13	20
4	25	42	13	0
5	26	42	12	39
6	27	43	12	19
7	28	43	11	58
8	29	44	11	36
9	X	44	11	15
10	1	44	10	54
11	2	45	10	32
12	3	45	10	10
13	4	45	9	48
14	5	46	9	26
15	6	46	9	4
16	7	46	8	41
17	8	46	8	19
18	9	46	7	56
19	10	46	7	33
20	11	47	7	10
21	12	47	6	47
22	13	47	6	24
23	14	47	6	1
24	15	46	5	38
25	16	46	5	15
26	17	46	4	51
27	18	46	4	28
28	19	46	4	4

☉ in  Leape yeare.

	D.	M.	D.	M.
1	21	56	14	15
2	22	57	13	55
3	23	58	13	35
4	24	59	13	14
5	26	0	12	54
6	27	2	12	33
7	28	3	12	12
8	29	4	11	50
9	X	5	11	26
10	1	6	11	7
11	2	7	10	45
12	3	8	10	23
13	4	9	10	1
14	5	10	9	39
15	6	12	9	16
16	7	13	8	53
17	8	14	8	31
18	9	15	8	8
19	10	16	7	45
20	11	17	7	22
21	12	18	6	58
22	13	19	6	35
23	14	19	6	12
24	15	20	5	48
25	16	21	5	24
26	17	22	5	0
27	18	23	4	37
28	19	23	4	13
29	20	24	3	49

South Declination.

5.
Bulls eye, is a starre of the first bignesse, whose declination is 15. degrees 38. minutes North, and right ascension 4. houres 13. minutes.

6.
Orions left foote, of the first bignesse, declination 8. degrees 42. minutes South, right ascension 4. houres 55. minutes.

7.
Orions left shoulder, of the second bignes, declination is 5. degrees 56. minutes North, right ascension 5. houres 4. minutes.

8.
First in Orions Circle, of the second bignes, declination 38. minutes South, right ascension, 5. houres, 12. minutes.

9.
Orions right shoulder, of the first bignesse, declination 6. degrees 17. minutes North, right ascension 6. houres 34. minutes.

March hath 31. dayes.

The Prime.			Leng. of the day. H. M.	True Place and Declination.			
				☉ in ✕ First yeere.		☉ in ✕ second yeere.	
				D. M.	D. M.	D. M.	D. M.
7. viij. xvj. 11.	1	D Dauid.	11 20	1 21 14	3 29	1 21 0	3 35
	2	E	11 24	2 22 14	3 6	2 21 59	3 11
	3	F	11 28	3 23 13	2 42	3 22 59	2 48
	4	G	11 32	4 24 13	2 18	4 23 59	2 24
	5	A	11 36	5 25 13	1 54	5 24 58	2 0
10. v. 1. xiii. ii. 6	6	B	11 40	6 26 12	1 30	6 25 58	1 37
	7	C	11 44	7 27 12	1 7	7 26 57	1 13
	8	D	11 48	8 28 11	0 43	8 27 57	0 49
8. x. xviij. 7.	9	E	11 52	9 29 01	0 20	9 28 56	0 26
	10	F	11 56	10 30 00	0 4	10 29 55	0 2
	11	G Gregor.	12 0	11 1 9	0 27	11 30 55	0 22
8. viij. xv. 9.	12	A	12 4	12 2 8	0 51	12 1 54	0 45
	13	B	12 8	13 3 8	1 15	13 2 53	1 9
	14	C	12 12	14 4 7	1 38	14 3 53	1 31
	15	D	12 16	15 5 6	2 3	15 4 52	1 56
	16	E	12 20	16 6 5	2 25	16 5 51	2 20
iiiij. xij. 6.	17	F	12 24	17 7 4	2 49	17 6 50	2 43
	18	G Edward.	12 28	18 8 4	3 13	18 7 49	3 7
	19	A	12 32	19 9 3	3 36	19 8 48	3 30
5. j. ix. 10.	20	B Benedic.	12 36	20 10 2	3 59	20 9 47	3 53
	21	C	12 40	21 11 0	4 22	21 10 46	4 17
	22	D	12 43	22 11 58	4 45	22 11 45	4 40
xviij. 6. vj. 11.	23	E	12 47	23 12 58	5 8	23 12 44	5 3
	24	F Fast.	12 50	24 13 57	5 31	24 13 43	5 26
	25	G Annaun-	12 54	25 14 56	5 54	25 14 42	5 49
1. xiiij. iiij. 8.	26	A ciation	12 48	26 15 55	6 17	26 15 41	6 12
	27	B of Mary.	13 2	27 16 53	6 39	27 16 40	6 34
	28	C	13 6	28 17 52	7 2	28 17 38	6 56
9. xj. xix. 3.	29	D	13 12	29 18 51	7 25	29 18 36	7 19
	30	E	13 18	30 19 49	7 47	30 19 35	7 41
	31	F	13 24	31 20 48	8 9	31 20 34	8 4

March.

of the Sunne.

☉ in X third year.				☉ in X Leape year.			
	D.	M.	D. M.		D.	M.	D. M.
1	20	45	3 41	1	21	30	3 23
2	21	45	3 17	2	22	30	2 38
3	22	45	2 53	3	23	30	2 35
4	23	44	2 30	4	24	29	2 12
5	24	44	2 6	5	25	28	1 49
6	25	43	1 42	6	26	28	1 25
7	26	43	1 19	7	27	27	1 1
8	27	42	0 55	8	28	26	0 38
9	28	42	0 31	9	29	26	0 14
10	29	41	0 8	10	✓ 25	0	10
11	✓ 40	0	16	11	1 25	0	34
12	1 40	0	40	12	2 24	0	57
13	2 39	1	3	13	3 23	1	21
14	3 38	1	27	14	4 22	1	44
15	4 37	1	50	15	5 22	2	8
16	5 37	2	14	16	6 21	2	32
17	6 35	2	37	17	7 20	2	55
18	7 35	3	1	18	8 19	3	19
19	8 34	3	25	19	9 18	3	42
20	9 33	3	48	20	10 17	4	5
21	10 32	4	11	21	11 15	4	28
22	11 31	4	34	22	12 14	4	51
23	12 30	4	57	23	13 13	5	14
24	13 29	5	20	24	14 12	5	37
25	14 28	5	43	25	15 11	6	0
26	15 26	6	6	26	16 10	6	23
27	16 25	6	29	27	17 8	6	45
28	17 24	6	52	28	18 7	7	9
29	18 23	7	14	29	19 6	7	30
30	19 21	7	36	30	20 4	7	52
31	20 20	7	58	31	21 3	8	15

South Declination.

North Declination.

10.

The great Dog, is a Starre of the first bignesse, whose Declination. is 16. degrees 12. minutes Southwards, and his right ascension 6. houres 27. minutes.

11.

The little Dog is a Starre of the the first bignesse, Declination is 6. degr 13. minutes north, right ascension 7. hours 18. minutes.

12.

Brightest in Hydra, is a Starre of the second bignesse, Declination 6. degr. 93. min South, right ascension 9. hour. 8. minutes.

13.

Lyons heart, of the first bignesse, declination 13. deg. 55. minutes North, right ascension 9. houres 57. minut.

14.

Lyons necke, of the second bignesse, declination 21. deg. 52. minut. North, right ascension 9. houres 46. minutes.

23

April

Aprill hath 30. dayes.

The Prime.			Leng. of the day.	True Place and Declination.			
				☉ in ♈ First yeare.		☉ in ♈ second yeare.	
				H. M.	D. M. D. M.	D. M. D. M.	
	1	G	13 30	1	21 46	8 31	1 21 32 8 25
xvj. 4.	2	A	13 34	2	22 45	8 53	2 22 31 8 48
	3	B	13 38	3	23 44	9 15	3 23 30 9 9
v.	4	C Ambrof	13 42	4	24 42	9 36	4 24 28 9 31
xiiij. 8.	5	D	13 46	5	25 41	9 58	5 25 27 9 53
7. ij.	6	E	13 50	6	26 39	10 19	6 26 25 10 14
x. 5.	7	F	13 53	7	27 37	10 40	7 27 23 10 35
	8	G	13 56	8	28 36	11 1	8 28 22 10 56
2. xvij.	9	A	13 59	9	29 34	11 22	9 29 20 11 17
	10	B	14 2	10	30 32	11 42	10 30 18 11 37
vij. 8.	11	C	14 5	11	31 31	12 3	11 31 17 11 58
	12	D	14 8	12	32 29	12 22	12 32 15 12 18
2. xv.	13	E	14 12	13	33 27	12 43	13 33 13 12 38
iiiij. 8.	14	F	14 15	14	34 25	13 2	14 34 11 12 58
	15	G	14 20	15	35 24	13 22	15 35 9 13 17
9. xij.	16	A	14 24	16	36 23	13 42	16 36 8 13 37
j. 9.	17	B	14 28	17	37 20	14 1	17 37 6 13 56
	18	C	14 32	18	38 18	14 19	18 38 4 14 15
ix. 2.	19	D	14 36	19	39 16	14 38	19 39 2 14 34
	20	E	14 40	20	40 14	14 56	20 40 0 14 58
2. xvij.	21	F	14 44	21	41 12	15 15	21 41 58 15 12
vj.	22	G	14 47	22	42 10	15 33	22 42 56 15 28
xiiij. 8.	23	A S. Geor.	14 50	23	43 8	15 50	23 43 54 15 46
	24	B Fast.	14 53	24	44 7	16 8	24 44 51 16 3
7. ij.	25	C S. Mark.	14 56	25	45 3	16 25	25 45 49 16 20
xj. 2.	26	D	14 59	26	46 2	16 42	26 46 47 16 37
	27	E	15 2	27	47 59	16 58	27 47 45 16 54
7. xix.	28	F	15 5	28	48 56	17 14	28 48 43 17 11
	29	G	15 8	29	49 54	17 30	29 49 40 17 26
vij. 2.	30	A	15 12	30	50 52	17 47	30 50 38 17 42

North Declination.

Aprill.

of the Sunne.

☉ in V third year.

☉ in V Leape year.

	D.	M.	D.	M.		D.	M.	D.	M.
1	21	18	8	20	1	22	3	8	37
2	22	17	8	42	2	23	1	8	59
3	23	16	9	4	3	24	0	9	21
4	24	14	9	26	4	24	58	9	42
5	25	13	9	47	5	25	57	10	3
6	26	11	10	9	6	26	55	10	25
7	27	10	10	30	7	27	54	10	46
8	28	8	10	51	8	28	52	11	7
9	29	6	11	12	9	29	50	11	27
10	8	4	11	32	10	8	49	11	48
11	1	3	11	53	11	1	47	12	8
12	2	1	12	13	12	2	45	12	28
13	2	59	12	33	13	3	43	12	48
14	3	57	12	53	14	4	41	13	7
15	4	55	13	11	15	5	39	13	27
16	5	54	13	32	16	6	38	13	47
17	6	52	13	51	17	7	36	14	6
18	7	50	14	10	18	8	34	14	25
19	8	48	14	29	19	9	32	14	43
20	9	46	14	48	20	10	30	15	1
21	10	44	15	6	21	11	28	15	20
22	11	42	15	24	22	12	26	15	37
23	12	39	15	41	23	13	24	15	55
24	13	37	15	59	24	14	21	16	12
25	14	35	16	16	25	15	19	16	29
26	15	33	16	33	26	16	17	16	46
27	16	31	16	49	27	17	15	17	3
28	17	29	17	7	28	18	13	17	19
29	18	26	17	23	29	19	10	17	35
30	19	24	17	38	30	20	8	17	50

North Declination.

15.

Lyons backe, is a starre of the second bignes, whose declination is 22. degrees 43. minutes Northward, and his right ascension is 10. houres, 52. minutes.

16.

Lyons taylor, of the first bignes, declination 16. degrees 50. minutes North, right ascension 11. houres 26. minutes.

17.

Rauens wing, of the third bignes, declination 15. degrees 50. minutes South, right ascension 11. houres 56. minutes.

18.

Virgins spike, of the first bignes declination 9. degrees South, right ascension 13. houres 5. minutes.

D 4

May

May hath 31. dayes.

The Prime.		Fast.	Leng. of the day.	True Place and Declination.					
				☉ in First & yeere.			☉ in & second yere.		
				H. M.	D. M.	D. M.	D. M.	D. M.	D. M.
11. viij.	1	B Phil. and	15 16	1	20 50	18 2	1	20 36	17 58
6. xvj.	2	C Iacob.	15 20	2	21 47	18 17	2	21 34	18 13
9. v.	3	D Inuent.	15 23	3	22 45	18 32	3	22 31	18 28
	4	E Crosse.	15 26	4	23 43	18 46	4	23 29	18 43
8. xiii. ii.	5	F	15 39	5	24 40	19 0	5	24 26	18 57
	6	G Ioh. por.	15 32	6	25 38	19 14	6	25 24	19 11
4. x.	7	A Latin.	15 5	7	26 35	19 28	7	26 22	19 25
	8	B	15 38	8	27 33	19 41	8	27 19	19 38
xviij. 9.	9	C	15 40	9	28 30	19 54	9	28 17	19 51
	10	D	15 42	10	29 28	20 7	10	29 14	20 3
3. vij.	11	E	15 44	11	II 25	20 19	11	II 12	20 16
xv. 8.	12	F	15 46	12	I 23	20 31	12	I 10	20 28
	13	G	15 48	13	2 20	20 42	13	2 6	20 39
8. iiij.	14	A	15 50	14	3 18	20 53	14	3 4	20 51
xij.	15	B	15 53	15	4 15	21 4	15	4 1	21 2
	16	C	15 16	16	5 12	21 15	16	4 59	21 12
	17	D	15 58	17	6 10	21 25	17	5 56	21 22
j.	18	E	16 0	18	7 7	21 35	18	6 53	21 32
6. ix.	19	Dunstan	16 0	19	8 5	21 44	19	7 51	21 32
xvij. i.	20	G	16 6	20	9 2	21 53	20	8 48	21 51
vj. 8.	21	A	16 9	21	9 59	22 2	21	9 45	22 0
	22	B	16 12	22	10 55	22 10	22	10 43	22 8
8. xiiij.	23	C	16 14	23	11 54	22 18	23	11 4	22 16
iiij. i.	24	D	16 16	24	12 51	22 25	24	12 37	22 23
	25	E	16 18	25	13 48	22 32	25	13 35	22 31
10. xj.	26	F	16 20	26	14 45	22 39	26	14 32	22 37
6. xix.	27	G	16 23	27	15 43	22 45	27	15 29	22 44
	28	A	16 24	28	16 40	22 51	28	16 26	22 50
	29	B	16 26	29	17 37	22 57	29	17 24	22 56
8. viij.	30	C	16 27	30	18 34	23 2	30	18 20	23 1
xvj. 6.	31	D	16 28	31	19 31	23 7	31	19 18	23 6

North Declination.

May.

of the Sunne.

☉ in 8 third year.

☉ in 8 Leape year.

D. M D. M.				D. M D. M.			
1	20	22	17 54	1	21	6	18 6
2	21	20	18 30	2	22	3	18 21
3	22	13	18 24	3	23	1	18 36
4	23	16	18 39	4	24	58	18 50
5	24	13	18 54	5	24	56	19 4
6	25	10	19 8	6	25	54	19 18
7	26	8	19 21	7	26	52	19 32
8	27	5	19 35	8	27	49	19 45
9	28	3	19 48	9	28	46	19 57
10	29	0	20 0	10	29	44	20 10
11	29	58	20 13	11	II	41	20 22
12	II	55	20 25	12	I	39	20 34
13	I	53	20 37	13	2	36	20 45
14	2	50	20 48	14	3	33	20 56
15	3	47	21 59	15	4	31	20 7
16	4	45	21 10	16	5	29	21 18
17	5	42	21 20	17	6	26	21 28
18	6	39	21 30	18	7	23	21 37
19	7	37	21 40	19	8	20	21 46
20	8	34	21 49	20	9	18	21 55
21	9	32	21 58	21	10	15	22 4
22	10	29	22 6	22	II	12	22 12
23	11	26	22 14	23	12	9	22 20
24	12	23	22 22	24	13	7	22 27
25	13	21	22 29	25	14	4	22 34
26	14	18	22 36	26	15	1	22 41
27	15	15	22 42	27	15	58	22 47
28	16	12	22 48	28	16	56	22 53
29	17	10	22 54	29	17	53	22 58
30	18	7	23 59	30	18	50	23 3
31	19	4	23 4	31	19	47	23 8

North Declination.

19.

Arcturus or betwixt bootes
thighes, is a starre of the first
bignesse, whose declination is,
21. degrees 20. min. North,
and his right ascension is 13.
houres 55. minutes.

20.

South Balance, of the se-
cond bignesse, Declination
14. degrees 14. minut. South,
right ascension 14. houres 30.
minutes.

21.

North Balance, of the se-
cond bignesse, declination 7.
degrees 46. minutes South,
right ascension 14. houres
55. minutes.

22.

Scorpions heart, is a starre
of the first bignesse, whose de-
clination is 25. degrees, 25.
minutes South, right ascensi-
on 16. houres 6. minutes.

June

June hath 30. dayes.

The Prime.		Leng. of the day.	True Place and Declination.									
			H. M.	☉ in II First yeere.				☉ in III second yeere.				
				D. M.	D. M.	D. M.	D. M.	D. M.	D. M.			
	1 E	16 28	1	20	29	23	11	1	20	15	23	10
8.v.	2 F	16 28	2	21	26	23	15	2	21	12	23	14
i. xij.	3 G	16 29	3	22	23	23	18	3	22	9	23	17
7.ij.	4 A	16 29	4	23	20	23	21	4	23	6	23	21
x. 10.	5 B Bonifac.	16 29	5	24	17	23	24	5	24	4	23	23
	6 C	16 29	6	25	14	23	26	6	25	1	23	26
xvij.6.	7 D	16 30	7	26	11	23	28	7	25	58	23	28
	8 E	16 30	8	27	9	23	30	8	26	55	23	29
vij. 8.	9 F	16 30	9	28	6	23	31	9	27	52	23	30
	10 G	16 30	10	29	3	23	31	10	28	49	23	31
9.xv.	11 A Barnaby	16 30	11	30	0	23	31	11	29	46	23	31
i i. iiij.	12 B	16 30	12	☾	57	23	31	12	☾	43	23	31
xij. 10.	13 C	16 30	13	1	54	23	31	13	1	40	23	31
	14 D	16 30	14	2	51	23	30	14	2	38	23	30
	15 E	16 30	15	3	48	23	28	15	3	35	23	29
9.j.	16 F	16 30	16	4	45	23	26	16	4	32	23	27
ix. 9.	17 G	16 29	17	5	42	23	24	17	5	29	23	25
	18 A	16 29	18	6	38	23	21	18	6	26	23	22
xvij.2.	19 B	16 28	19	7	37	23	18	19	7	23	23	19
8.vj.	20 C Edward	16 27	20	8	34	23	15	20	8	20	23	16
xiiij.	21 D	16 26	21	9	31	23	11	21	9	17	23	12
iiij. 11.	22 E	16 25	22	10	28	23	7	22	10	14	23	8
	23 F Fast.	16 24	23	11	25	23	2	23	11	11	23	3
xj.3.	24 G Iohn Ba	16 23	24	12	22	22	57	24	12	8	22	58
	25 A	16 22	25	13	19	22	51	25	13	6	22	53
3. xix.	26 B	16 20	26	14	16	22	45	26	14	3	22	47
	27 C	16 18	27	15	14	22	39	27	15	0	22	41
vij.4.	28 D Fast.	16 16	28	16	11	22	32	28	15	57	22	34
	29 E St. Peter	16 14	29	17	8	22	25	29	16	54	22	27
8. xvj.	30 F	16 13	30	18	5	22	18	30	17	51	22	20

North Declination.

June.

of the Sunne.

☉ in II third yeare.					☉ in II Leape yeare.				
D. M.		D. M.			D. M.		D. M.		
1	20	2	23	9	1	20	44	23	12
2	20	58	23	13	2	21	42	23	16
3	21	55	23	17	3	22	40	23	19
4	22	53	23	20	4	23	36	23	22
5	23	50	23	23	5	24	33	23	25
6	24	47	23	25	6	25	30	23	27
7	25	44	23	27	7	26	27	23	29
8	26	41	23	29	8	27	24	23	30
9	27	38	23	30	9	28	21	23	30
10	28	35	23	31	10	29	19	23	31
11	29	32	23	31	11	30	17	23	31
12	30	30	23	31	12	1	13	23	31
13	1	27	23	31	13	2	10	23	30
14	2	24	23	30	14	3	7	23	29
15	3	21	23	29	15	4	4	23	28
16	4	18	23	27	16	5	1	23	26
17	5	15	23	25	17	5	58	23	23
18	6	12	23	23	18	6	55	23	21
19	7	9	23	20	19	7	52	23	17
20	8	6	23	17	20	8	49	23	14
21	9	2	23	13	21	9	47	23	10
22	10	0	23	9	22	10	45	23	5
23	10	58	23	4	23	11	41	23	0
24	11	55	23	59	24	12	38	22	55
25	12	52	22	54	25	13	35	22	50
26	13	49	22	48	26	14	32	22	44
27	14	46	22	42	27	15	29	22	37
28	15	43	22	36	28	16	26	22	31
29	16	40	22	29	29	17	23	22	23
30	17	37	22	23	30	18	21	22	16

North Declination.

23.

Hercules head, is a Starre of the third bignes, whose Declination is 14. degrees 57. minuts North, and right ascension 16. houres 57. minutes.

24.

Eagles heart, is a Starre of the second bignes, Declination 17. degrees 54. min. North, right ascension 19. houres 32. minutes.

25.

Dolphins taylor, of the third bignesse, declination 10. degrees North, right ascension 20. houres, 16. minutes.

26.

Goates taylor, of the third bignes, declination 17. degrees 51. minutes South, right ascension 21. houres 27. minutes.

July.

Iuly hath 31. dayes.

The Prime.			Leng. of the day.	True Place and Declination.							
				☉ in ☿ First year.				☉ in ☿ second year.			
				H. M.	D. M.		D. M.	D. M.		D. M.	D. M.
2. v.	1	G	Visitati.	16 12	1	19	2	22	10	1	18 48 22 12
xiiij. 8.	2	A	Mary.	16 10	2	19	59	22	2	2	19 45 22 4
ij. 7.	3	B	Martin.	16 8	3	20	56	21	53	3	20 43 21 55
	4	C		16 6	4	21	53	21	44	4	21 40 21 46
x.	5	D		16 4	5	22	51	21	35	5	22 37 21 37
	6	E		16 1	6	23	48	21	25	6	23 34 21 28
4. xvij.	7	F		15 57	7	24	45	21	15	7	24 31 21 18
	8	G		15 54	8	25	42	21	5	8	25 29 21 7
9. vij.	9	A		15 51	9	26	39	20	54	9	26 26 20 56
xv.	10	B		15 48	10	27	37	20	43	10	27 23 20 45
iiij. 8.	11	C		15 46	11	28	35	20	31	11	28 20 20 34
	12	D		15 44	12	29	31	20	19	12	29 17 20 22
3. xij.	13	E		15 41	13	Ω	28	20	7	13	Ω 15 20 10
	14	F		15 38	14	1	26	19	55	14	1 12 19 58
6. j.	15	G	Swithin	15 35	15	2	23	19	42	15	2 9 19 45
	16	A		15 32	16	3	20	19	29	16	3 7 19 32
2. ix.	17	B		15 29	17	4	18	19	15	17	4 4 19 18
xvij. 10.	18	C		15 26	18	5	15	19	1	18	5 1 19 5
vj.	19	D	Dog.d.b	15 23	19	5	59	19	47	19	5 59 18 51
xiiij. 8.	20	E	Margar.	15 20	20	7	10	18	33	20	6 56 18 36
	21	F		15 17	21	8	7	18	18	21	7 53 18 22
iiij.	22	G	Magdal.	15 13	22	9	4	18	3	22	8 51 18 7
	23	A		15 10	23	10	2	17	48	23	9 48 17 51
6. xi.	24	B	Fast.	15 8	24	10	59	17	32	24	10 46 17 36
xix. 11.	25	C	S. Iames	15 5	25	11	57	17	16	25	11 43 17 20
	26	D	Anna.	15 3	26	12	54	17	0	26	12 40 17 4
	27	E		15 0	27	13	52	16	43	27	13 38 16 47
9. viij.	28	F		14 57	28	14	49	16	27	28	14 35 16 31
xvj.	29	G		14 55	29	15	47	16	10	29	15 33 16 14
v. 7.	30	A		14 52	30	16	44	15	52	30	16 31 15 57
	31	B		14 50	31	17	42	15	35	31	17 28 15 39

North Declination.

July.

of the Sunne.

☉ in 3 third yeare.				☉ in 3 Leape yeare			
	D.	M.	D. M.		D.	M.	D. M.
1	18	34	22 14	1	19	17	22 8
2	19	32	22 6	2	20	15	22 0
3	20	29	21 57	3	21	12	21 51
4	21	26	21 49	4	22	9	21 42
5	22	23	21 40	5	23	7	21 32
6	23	20	21 30	6	24	4	21 22
7	24	17	21 20	7	25	0	21 12
8	25	15	21 10	8	25	58	21 2
9	26	12	20 59	9	26	55	20 51
10	27	9	20 48	10	27	53	20 40
11	28	6	20 37	11	28	50	20 28
12	29	4	20 25	12	29	47	20 16
13	☿	1	20 13	13	☿	44	20 4
14	0	55	20 2	14	1	42	19 51
15	1	53	19 49	15	2	39	19 38
16	2	50	19 36	16	3	36	19 25
17	3	47	19 22	17	4	33	19 12
18	4	45	19 9	18	5	31	18 58
19	5	42	18 55	19	6	28	18 43
20	6	39	18 41	20	7	26	18 29
21	7	37	18 26	21	8	23	18 14
22	8	34	18 11	22	9	20	17 59
23	9	32	17 57	23	10	18	17 43
24	10	30	17 40	24	11	15	17 28
25	11	27	07 24	25	12	13	17 12
26	12	20	17 9	26	13	10	16 56
27	13	22	16 50	27	14	8	16 39
28	14	19	16 36	28	15	5	16 22
29	15	17	19 19	29	16	3	16 5
30	16	14	16 2	30	17	0	15 48
31	17	12	15 44	31	17	58	15 30

North Declination.

27.

Pegasus shoulder, of the 2^d bignesse, declination 12. degr. 58. min. North, right ascension 22. houres, 46. minutes.

28.

Pegasus Leg, of the thirde bignesse, declination 25. deg. 58. minutes North, right ascension 22. houres 44. minutes.

29.

Swans taylor, is a Starre of the second bignesse, whose Declination is 43. deg. 54. min. North, right ascension 20. houres 30. minutes.

30.

The Waggoners right shoulder, is a Starre of the second bignesse, Declination 43. degrees 49. minutes North and right ascension 5. houres 30. minutes.

31.

Hircus the Goate, of the first bignesse, declination 45. degrees 30. minutes, right ascension, 4. houres, 49. minutes.

32.

Lyra of the first bignesse, North Declination 38. degrees 30. minutes, right ascension 18. houres, 20. minutes.

August

August hath 31. dayes.

The Prime.			Leng. of the day. H. M.	True Place and Declination.			
				☉ in ♈ First yeere.		☉ in ♈ second yere.	
				D. M.	D. M.	D. M.	D. M.
6.xiii.	1	C Lammas	14 46	1	18 40	15 17	1 18 26 15 21
2.ij.	2	D	14 42	2	19 37	14 56	2 19 23 15 4
	3	E	14 38	3	20 35	14 41	3 20 21 14 45
7. x.	4	F	14 34	4	21 33	14 22	4 21 19 14 27
xv.ij. 9.	5	G	14 40	5	22 30	14 4	5 22 17 14 8
	6	A	14 36	6	23 28	13 45	6 23 14 13 49
vij.	7	B	14 32	7	24 26	13 25	7 24 11 13 30
xv. 7.	8	C	14 28	8	25 24	13 5	8 25 10 13 10
	9	D	14 23	9	26 21	12 47	9 26 8 12 51
5. iij.	10	E Lawren.	14 16	10	27 19	12 27	10 27 5 12 32
xij. 11.	11	F	14 9	11	28 17	12 7	11 28 3 12 12
	12	G	14 6	12	29 15	11 47	12 29 1 11 51
	13	A	14 3	13	30 13	11 27	13 29 56 11 31
3.j.	14	B	14 0	14	1 11	11 6	14 30 57 11 11
ix. 12.	15	C	13 56	15	2 9	10 45	15 1 55 10 51
	16	D	13 52	16	3 7	10 24	16 2 53 10 29
vj. 7. xvij.	17	E	13 50	17	4 5	10 3	17 3 51 10 8
	18	F	13 44	18	5 3	9 42	18 4 49 9 47
9. xiiij.	19	G	13 40	19	6 1	9 20	19 5 47 9 25
	20	A	13 35	20	6 59	8 59	20 6 45 9 4
8. iij.	21	B	13 30	21	7 57	8 37	21 7 43 8 42
xj. 9.	22	C	13 25	22	8 55	8 15	22 8 41 8 21
	23	D	13 20	23	9 55	7 53	23 9 40 7 58
xix. 4.	24	E Barthol.	13 15	24	10 51	7 31	24 10 36 7 37
	25	F Apostle.	13 10	25	11 50	7 9	25 11 34 7 15
vij.	26	G	13 6	26	12 48	6 47	26 12 33 6 52
xvj. 8.	27	A	13 2	27	13 46	6 24	27 13 31 6 30
	28	B	12 58	28	14 44	6 2	28 14 29 6 8
7.v.	29	C Behead.	12 54	29	15 43	5 39	29 15 28 5 45
xiiij. 5.	30	D of Iohn.	12 51	30	16 42	5 16	30 16 26 5 22
	31	E	12 48	31	17 40	4 53	31 17 25 4 56

North Declination.

South Declination.

August.

of the Sunne.

☉ in ♈ third yeare.

	D.	M.	D.	M.
1	18	12	15	26
2	19	9	15	8
3	20	7	14	50
4	21	5	14	31
5	22	2	14	13
6	23	0	13	54
7	23	58	13	35
8	24	56	13	15
9	25	53	12	56
10	26	51	12	36
11	27	49	12	16
12	28	47	11	56
13	29	45	11	36
14	☾	43	11	16
15	1	41	10	55
16	2	39	10	34
17	3	37	10	13
18	4	35	9	52
19	5	33	9	31
20	6	31	9	9
21	7	29	8	48
22	8	27	8	26
23	9	25	8	4
24	10	23	7	42
25	11	22	7	20
26	12	20	6	57
27	13	19	6	35
28	14	17	6	12
29	15	15	5	50
30	16	14	5	27
31	17	12	5	4

North Declination.

☉ in ♈ Leape yeare.

	D.	M.	D.	M.
1	18	56	15	12
2	19	54	14	54
3	20	51	14	36
4	21	48	14	17
5	22	46	13	59
6	23	44	13	39
7	24	42	13	20
8	25	40	13	1
9	26	37	12	41
10	27	35	12	21
11	28	33	12	1
12	29	31	11	41
13	☾	29	11	20
14	1	27	11	0
15	2	25	10	39
16	3	23	10	18
17	4	21	9	57
18	5	19	9	36
19	6	17	9	14
20	7	15	8	53
21	8	13	8	31
22	9	11	8	9
23	10	9	7	47
24	11	8	7	25
25	12	6	7	3
26	13	5	6	40
27	14	3	6	18
28	15	1	5	55
29	15	59	5	33
30	16	58	5	10
31	17	56	4	47

33.

Perseus right side of the second bigness, declination 47. deg. North, right ascension 2. houres 56. minutes.

34.

Fomahand, is a starre of the first bigness, hauing South Declination 33. deg. 15. min. and right ascension 22. houres 40. minutes.

35.

In the knee of Sagirarius, is a starre of the second bigness, hauing South declination 42. degr. and right ascension 18. houres 44. minutes.

Starres neere about the North Pole, with their distance from the sayd Pole.

1.

The Pole starre is of the third bigness, whose distance from the Pole is 2. degr. 52. min. and his right ascension is 50. minutes.

2.

The foremost Guard, of the 2. bigness, distant from the Pole 14. degr. 11. min. right ascension 14. hou. 54. min.

3.

The hindermost Guard of the 2. bigness, distant 16. deg. 42. min. right ascension 15. houres 26. minutes.

Septem.

September hath 30. dayes.

The Prime.			Leng. of the day.	True Place and Declination.							
				☉ in my First year.				☉ in my second year.			
				H. M.	D. M.		D. M.	D. M.		D. M.	D. M.
12. ii.	1	F	Giles.	12 48	1	18	39	4	30	1	18 24 4 36
7. 8.	2	G		12 44	2	19	37	4	7	2	19 23 4 13
	3	A		12 40	3	20	36	3	44	3	20 20 3 50
3. xviiij.	4	B		12 36	4	21	35	3	21	4	21 20 3 27
vij. 7.	5	C	Dog day	12 32	5	22	33	2	58	5	22 19 3 4
	6	D	end.	12 28	6	23	32	2	35	6	23 18 2 40
9. xv.	7	E	Nat. Eli.	12 24	7	24	31	2	11	7	24 16 2 17
iiij. 9.	8	F	Nat. Ma.	12 20	8	25	29	1	48	8	25 15 1 34
	9	G		12 16	9	26	28	1	27	9	26 13 1 31
2. xii.	10	A		12 12	10	27	27	1	1	10	27 12 1 7
	11	B		12 8	11	28	26	0	38	11	28 11 0 43
i. ii.	12	C		12 4	12	29	25	0	14	12	29 10 0 20
	13	D		12 0	13	30	24	0	10	13	30 9 0 4
2. ix.	14	E	Hol. Cr.	11 56	14	1	23	0	33	14	1 8 0 27
xvii. 8.	15	F		11 52	15	2	21	0	56	15	2 7 0 51
8. vi.	16	G		11 48	16	3	20	1	20	16	3 6 1 14
xiii. 2.	17	A	Lambar.	11 44	17	4	19	1	43	17	4 5 1 38
	18	B		11 40	18	5	18	2	7	18	5 4 2 1
iiij. 7.	19	C		11 36	19	6	18	2	31	19	6 3 2 25
	20	D	Fast.	11 32	20	7	17	2	54	20	7 2 2 48
xi. 2.	21	E	Matth.	11 28	21	8	16	3	17	21	8 1 3 11
	22	F		11 24	22	9	15	3	41	22	9 0 3 35
5. xix.	23	G		11 20	23	10	15	4	4	23	10 0 3 58
viii. 9.	24	A		11 16	24	11	14	4	28	24	10 59 4 2
	25	B	Ciprian	11 12	25	12	13	4	51	25	11 59 4 4
8. xvi.	26	C		11 8	26	13	13	5	14	26	12 58 5 8
v. 5.	27	D		11 4	27	14	12	5	37	27	13 58 5 32
	28	E	Fast.	11 0	28	15	12	6	0	28	14 57 5 55
4. xiii.	29	F	S. Mich.	10 56	29	16	11	6	23	29	15 57 6 18
ii. 6.	30	G	Hierom.	10 52	30	17	11	6	46	30	16 56 6 41

North Declination.

South Declination.

September.

of the Sunne.

☉ in m^{y} third year.

☉ in m^{y} Leape year.

D. M. D. M.				North Declination.	D. M D. M.			
1	18	11	4 41	North Declination.	1	18	55	4 24
2	19	9	4 19		2	19	53	4 1
3	20	8	3 55		3	20	52	3 38
4	21	6	3 32		4	21	51	3 15
5	22	5	3 9		5	22	49	2 52
6	23	3	2 46		6	23	48	2 28
7	24	2	2 23		7	24	47	2 5
8	25	1	1 59		8	25	46	1 41
9	26	0	1 36		9	26	45	1 18
10	26	58	1 13		10	27	43	0 55
11	27	57	0 49		11	28	42	0 31
12	28	56	0 26		12	29	41	0 9
13	29	55	0 2		13	30	40	0 16
14	30	54	0 22	14	1	39	0 49	
15	1	53	0 45	15	2	38	1 3	
16	2	52	1 9	16	3	37	1 27	
17	3	51	1 32	17	4	36	1 50	
18	4	50	1 56	18	5	35	2 14	
19	5	49	2 19	19	6	34	2 37	
20	6	48	2 43	20	7	33	3 0	
21	7	47	3 6	21	8	32	3 24	
22	8	47	3 30	22	9	32	3 47	
23	9	46	3 53	23	10	31	4 11	
24	10	45	4 16	24	11	39	4 34	
25	11	45	4 40	25	12	30	4 57	
26	12	44	5 3	26	13	29	5 20	
27	13	43	5 26	27	14	29	5 44	
28	14	43	5 49	28	15	28	6 7	
29	15	2	6 42	29	16	27	6 26	
30	16	42	6 35	30	17	27	6 52	
				South Declination.				

4.

The end of the Dragons
taylor of the third bignesse, di-
stant from the Pole 18. degr.
26. minutes, right ascension
11. houres, 8. minutes.

5.

The great Beares backe of
the second bignesse, distant
from the Pole 26. degrees 5.
minutes right ascension 10.
houres 40. minutes.

6.

Cepheus right shoulder, of
the third bignesse, distant 29.
degrees, right ascension 21.
houres 10. minutes.

7.

The great Beares side, of
the second bignesse, distant 31.
degr. 26. minutes, right ascen-
sion 10. houres 58. minutes.

8.

The first in her taylor of the
second bignesse distant 31. de-
grés 49. min. right ascension
12. houres, 32. minutes.

☉

October

October hath 31. dayes.

The Prime.			Leng. of the day.	True Place and Declination.							
				☉ in ♈ First year				☉ in ♈ second year			
				H. M.	D.	M.	D.	M	D.	M.	D.
	1	A	10 48	1	18	10	7	9	1	17	56
2. x.	2	B	10 44	2	19	10	7	32	2	18	55
xviii. 10	3	C	10 40	3	20	9	7	54	3	19	55
	4	D	10 36	4	21	9	8	17	4	20	55
8. vij.	5	E	10 32	5	22	9	8	39	5	21	54
xv.	6	F Faith.	10 28	6	23	9	9	2	6	22	54
	7	G	10 24	7	24	8	9	24	7	23	54
iiiij. 1.	8	A	10 20	8	25	8	19	46	8	24	54
	9	B Denis.	10 16	9	26	8	10	8	9	25	54
4. xij.	10	C	10 12	10	27	8	10	29	10	26	53
	11	D	10 8	11	28	8	10	51	11	27	53
j.	12	E	10 4	12	29	8	11	12	12	28	53
ix. 10.	13	F Edward	10 0	13 ^m		8	11	34	13	29	53
xvij. 17.	14	G	9 56	14	1	8	11	55	14 ^m	53	11
vj. 3.	15	A	9 52	15	2	8	12	15	15	1	53
	16	B	9 48	16	3	8	12	36	16	2	54
8. xiiij.	17	C	9 44	17	4	8	12	57	17	3	54
	18	D	9 40	18	5	8	13	17	18	4	54
iiij.	19	E	9 36	19	6	9	13	37	19	5	54
	20	F	9 32	20	7	9	13	57	20	6	54
6. xi.	21	G	9 28	21	8	9	14	16	21	7	55
xix. 8.	22	A	9 24	22	9	10	14	36	22	8	55
	23	B	9 20	23	10	10	14	55	23	9	55
7. vij.	24	C	9 17	24	11	10	15	14	24	10	56
xvj. 2.	25	D Crispin.	9 14	25	12	11	15	33	25	11	56
	26	E	9 10	26	13	11	15	51	26	12	56
4. v.	27	F	9 7	27	14	12	16	9	27	13	57
	28	G	9 4	28	15	12	16	27	28	14	57
11. xiiij.	29	A & Iude.	9 0	29	16	13	16	45	29	15	58
2. ij.	30	B	8 56	30	17	13	17	2	30	16	58
x. iij.	31	C	8 52	31	18	14	17	19	31	17	59

South Declination.

October.

of the Sunne.

☉ in \approx third yeare.

☉ in \approx Leape yeare.

	D.	M.	D.	M.		D.	M.	D.	M.
1	17	41	6	58	1	18	27	7	15
2	18	41	7	21	2	19	26	7	38
3	19	41	7	44	3	20	26	8	1
4	20	40	8	6	4	21	26	8	23
5	21	40	8	28	5	22	25	8	45
6	22	40	8	51	6	23	25	9	8
7	23	39	9	13	7	24	25	9	30
8	24	39	9	38	8	25	25	9	52
9	25	39	9	57	9	26	25	10	14
10	26	39	10	19	10	27	24	10	35
11	27	39	10	41	11	28	24	10	57
12	28	39	11	2	12	29	24	11	18
13	29	39	11	23	13	m	24	11	39
14	m	39	11	44	14	1	24	12	0
15	1	39	12	5	15	2	24	12	21
16	2	39	12	26	16	3	25	12	42
17	3	39	12	47	17	4	25	13	2
18	4	39	13	6	18	5	25	13	22
19	5	39	13	27	19	6	25	13	42
20	6	40	13	47	20	7	25	14	2
21	7	40	14	7	21	8	26	14	22
22	8	40	14	26	22	9	26	14	41
23	9	41	14	46	23	10	26	15	0
24	10	41	15	5	24	11	26	15	19
25	11	41	15	24	25	12	27	15	38
26	12	42	15	42	26	13	27	15	56
27	13	42	16	0	27	14	28	16	14
28	14	43	16	19	28	15	29	16	32
29	15	43	16	36	29	16	29	16	49
30	16	44	16	54	30	17	30	17	7
31	17	44	17	11	31	18	30	17	24

South Declination.

9.

At the knees of Cassiopeia, is a Starre of the second bignesse, distant from the Pole 31. Degr. 50. minutes, right ascension 1. houre.

10.

In her lippe is a Starre of the third bignesse, distant 31. Degr. 26. minutes, right ascension 32. minutes.

11.

The backe of her Chaire, of the third bignesse, distant 33. Degrees 2. minutes, right ascension 23. houres 48. minutes.

12.

The great Beares thigh of the second bignesse, distant from the Pole 34. Degrees 3. minutes, right ascension 11. houres 32. minutes.

☉ 2

November

Nouember hath 30. dayes.

The Prime.			Leng. of the day.	True Place and Declination.					
				☉ in First m. yeere.			☉ in m. second yeere.		
				H. M.	D. M.	D. M.	D. M.	D. M.	D. M.
	1	D	All Sain.	8 49	1 19	14 17	36	1 18	59 17 32
5. xvij.	2	E		8 46	2 20	15 17	52	2 20	0 17 48
vij. 3.	3	F		8 43	3 21	16 18	8	3 21	1 18 5
	4	G		8 40	4 22	16 18	24	4 22	2 18 20
11. xv.	5	A	Poud. tr.	8 37	5 23	17 18	40	5 23	2 18 36
	6	B	Leonard	8 34	6 24	18 18	55	6 24	3 18 51
5. iij.	7	C		8 31	7 25	19 19	10	7 25	4 19 6
	8	D		8 28	8 26	19 19	24	8 26	5 19 21
11. xij.	9	E		8 25	9 27	20 19	38	9 27	5 19 35
j. 12.	10	F		8 26	10 28	21 19	52	10 28	7 19 48
	11	G	S. Mart.	8 16	11 29	22 20	5	11 29	8 20 2
2. ix.	12	A		8 16	12 7	23 20	18	12 7	9 20 15
xvij. 4.	13	B		8 13	13 1	24 20	31	13 1	10 20 28
8. vi.	14	C		8 10	14 2	25 20	43	14 2	11 20 40
xiii. 8.	15	D		8 7	15 3	26 20	55	15 3	12 20 52
	16	E		8 4	16 4	27 21	6	16 4	13 21 4
	17	F	Hugh.	8 2	17 5	28 21	17	17 5	14 21 15
5. iij.	18	G		8 0	18 6	29 21	28	18 6	15 21 26
xj. 9.	19	A		7 57	19 7	30 21	38	19 7	16 21 36
	20	B	Edmund	7 54	20 8	31 21	48	20 8	17 21 46
4. xix.	21	C		7 51	21 9	32 21	58	21 9	18 21 55
vij. 5.	22	D	Cicily.	7 49	22 10	33 22	7	22 10	19 22 4
	23	E	Clemen.	7 47	23 11	34 22	15	23 11	20 22 13
11. xvj.	24	F		7 45	24 12	35 22	23	24 12	22 22 21
	25	G	Kather.	7 43	25 13	37 22	31	25 13	23 22 29
10. v.	26	A		7 40	26 14	38 22	38	26 14	24 22 36
xii. 8.	27	B		7 38	27 15	39 22	45	27 15	25 22 43
	28	C		7 37	28 16	40 22	51	28 16	26 22 50
ij. 12.	29	D	Fast.	7 36	29 17	41 22	57	29 17	27 22 36
2. x.	30	E	Andrew	7 30	30 18	43 23	3	30 18	23 23 1

South Declination.

Nouember.

of the Sunne.

☉ in m third year.

☉ in m Leape year.

	D. M.		D. M.			D. M.		D. M.	
1	18	45	17	28	1	19	31	17	40
2	19	46	17	44	2	20	31	17	57
3	20	46	18	1	3	21	32	18	13
4	21	47	18	17	4	22	33	18	28
5	22	48	18	32	5	23	34	18	44
6	23	48	18	47	6	24	34	18	59
7	24	49	19	2	7	25	35	19	13
8	25	50	19	17	8	26	35	19	28
9	26	51	19	31	9	27	37	19	42
10	27	52	19	45	10	28	38	19	56
11	28	52	19	59	11	29	39	20	9
12	29	53	20	13	12	30	40	20	22
13	30	54	20	25	13	31	41	20	34
14	1	55	20	37	14	32	42	20	46
15	2	56	20	49	15	33	42	20	58
16	3	57	21	1	16	34	43	21	9
17	4	58	21	12	17	35	44	21	20
18	5	59	21	23	18	36	45	21	31
19	7	0	21	33	19	37	46	21	41
20	8	1	21	43	20	38	47	21	51
21	9	2	21	53	21	39	49	22	0
22	10	3	22	2	22	40	50	22	9
23	11	4	22	11	23	41	51	22	17
24	12	6	22	19	24	42	52	22	25
25	13	7	22	27	25	43	53	22	33
26	14	8	22	35	26	44	54	22	40
27	15	9	22	42	27	45	55	22	47
28	16	10	22	48	28	46	56	22	53
29	17	11	22	54	29	47	57	22	59
30	18	13	23	0	30	48	58	23	4

South Declination.



Certaine Starres neere vnto the South Pole, with their distance from the said Pole, and right Ascension.

1.

The Southermost Starre in the South triangle, is a Starre of the third bignesse, distant from the South Pole . 11. degr. 30. minutes, right ascension 9. houres.

2.

The Southermost of the Croisers, is a Starre of the second bignes, distant 22. degrees 30. minutes right ascension 12. minutes.

3.

In the Northwest angle of the South triangle, is a Starre of the second bignesse, distant from the Pole, 27. degrees 24. minutes, right ascension 8. houres 4. minutes.

☉ 3

December

December hath 31. dayes.

The Prime			Leng. of the day.	True Place and Declination.			
				☉ in 1 st year		☉ in 2 ^d year	
				H. M.	D. M.	D. M.	D. M.
xviii. 5.	1	F	7 34	1	19 44	23 8	1 19 29 23 6
	2	G	7 33	2	20 45	23 1	2 20 30 23 11
9. vii.	3	A	7 32	3	21 46	23 16	3 21 31 23 15
xv. 4.	4	B	7 31	4	22 47	23 20	4 22 33 23 19
	5	C	7 30	5	23 48	23 23	5 23 34 23 22
	6	D	7 30	6	24 50	23 25	6 24 35 23 25
10. iiii.	7	E	7 30	7	25 51	23 28	7 25 36 23 27
xii. 7.	8	F	7 30	8	26 52	23 29	8 26 38 23 29
	9	G	7 30	9	27 54	23 30	9 27 39 23 30
2. i.	10	A	7 30	10	28 55	23 31	10 28 40 23 31
ix. 7.	11	B	7 30	11	29 56	23 31	11 6 42 23 31
xvii. 15.	12	C	7 30	12	30 57	23 31	12 30 43 23 31
vi. 9.	13	D	7 30	13	1 59	23 31	13 1 44 23 31
	14	E	7 31	14	3 0	23 29	14 2 45 23 30
xiii. 3.	15	F	7 32	15	4 2	23 28	15 3 47 23 28
	16	G	7 33	16	5 3	23 26	16 4 48 23 26
iii. 1.	17	A	7 34	17	6 4	23 23	17 5 49 23 24
	18	B	7 35	18	7 6	23 20	18 6 51 23 21
xj.	19	C	7 36	19	8 7	23 17	19 7 52 23 17
xix. 8.	20	D	7 37	20	9 8	23 13	20 8 53 23 14
	21	E	7 38	21	10 10	23 8	21 9 55 23 9
8. viii.	22	F	7 39	22	11 11	23 3	22 10 56 23 4
xvj. 3.	23	G	7 40	23	12 12	22 58	23 11 57 22 59
	24	A	7 41	24	13 14	22 52	24 12 58 22 53
v. 10.	25	B	7 42	25	14 15	22 46	25 14 0 22 47
	26	C	7 43	26	15 16	22 39	26 15 2 22 40
xii. 3.	27	D	7 44	27	16 18	22 32	27 16 3 22 33
ii. 1.	28	E	7 46	28	17 19	22 24	28 17 4 22 26
x. 9.	29	F	7 48	29	18 20	22 16	29 18 6 22 18
	30	G	7 49	30	19 22	22 7	30 19 7 22 9
2. xviii.	31	A	7 50	31	20 23	21 58	31 20 8 22 0

South Declination

December.

of the Sunne.

☉ in 7 third yeare.

	D.	M.	D.	M.
1	9	14	23	9
2	20	15	23	10
3	21	16	23	14
4	22	18	23	18
5	23	19	23	21
6	24	20	23	24
7	5	22	23	27
8	26	23	23	29
9	27	24	23	30
10	28	26	23	31
11	29	27	23	31
12	30	28	23	31
13	1	30	23	31
14	2	31	23	30
15	3	32	23	29
16	4	34	23	27
17	5	35	23	24
18	6	36	23	22
19	7	38	23	18
20	8	39	23	14
21	9	40	23	10
22	10	42	23	6
23	11	43	23	0
24	12	44	22	55
25	13	46	22	49
26	14	47	22	42
27	15	48	22	35
28	16	50	22	28
29	17	51	22	20
30	18	52	22	12
31	19	53	22	3

☉ in 7 Leape yeare.

	D.	M.	D.	M.
1	20	0	23	14
2	21	2	23	13
3	22	3	23	17
4	23	4	23	21
5	24	6	23	24
6	25	7	23	26
7	26	8	23	28
8	27	9	23	30
9	28	11	23	31
10	29	12	23	31
11	30	13	23	31
12	1	15	23	31
13	2	16	23	30
14	3	17	23	29
15	4	19	23	27
16	5	20	23	25
17	6	21	23	22
18	7	23	23	19
19	8	24	23	15
20	9	25	23	11
21	10	27	23	7
22	11	28	23	2
23	12	29	22	56
24	13	31	22	50
25	14	32	22	45
26	15	33	22	37
27	16	34	22	30
28	17	36	22	22
29	18	37	22	14
30	19	38	22	5
31	20	40	21	56

South Declination.

4.

The fore-part of the Centaur of the second bignes, distant 29 degrees 54. minutes right ascension 14. houres, 44. minutes.

5.

Centaur's thigh of the second bignes, distant 40. degrees 30. minutes right ascension 11. houres, 54. minutes.

6.

Canopus in Argo nauis, of the first bignes, distant from the South Pole, 38. degrees 10. minutes right ascension 6. houres 20. minutes.

7.

The last of Eridanus, of the first bignes, distant 50. degrees, right ascension 3. houres.

How to vse these Starres, for the time of their being vpon the Meridian, & consequently to finde the height of the Pole or Latitude by them, followes afterward.

E 4

This

52
1646
36

The Sea-mans Kalender.

	♈		♉		♊	
	D.	M.	D.	M.	D.	M.
0	0	0	11	30	20	12
1	0	24	11	51	20	25
2	0	48	12	12	20	37
3	1	12	12	33	20	49
4	1	35	12	53	21	0
5	2	0	13	13	21	11
6	2	23	13	33	21	21
7	2	47	13	53	21	33
8	3	11	14	13	21	42
9	3	35	14	32	12	51
10	3	58	14	51	21	0
11	4	22	15	10	22	9
12	4	45	15	22	22	17
13	4	9	15	47	22	25
14	5	32	16	5	22	32
15	5	55	16	23	22	39
16	5	19	16	40	22	46
17	6	42	19	57	22	52
18	7	5	17	14	22	57
19	7	28	17	31	22	3
20	7	50	17	47	23	7
21	8	13	18	3	23	12
22	8	35	18	19	23	15
23	8	58	18	34	23	19
24	9	20	18	49	23	22
25	9	42	19	4	23	24
26	10	4	19	18	23	26
27	10	26	19	32	23	28
28	10	47	19	46	23	29
29	11	9	19	59	23	30
30	11	30	20	12	23	30
	♋		♌		♍	
	x		≈		v	

This Table sheweth the Declination of the Sunne upon every several degree of the Eclipticke through all the foure Quarters of the Zodiacke: by which Table you may make tryall of the former Table of Declination, if you doubt of any part thereof, as followeth.

First, by the Kalender or Ephemerides next before, finde out the day of the Moneth, for which you desire the declination, and right against the same you shall haue the signe, degree and minute, which the Sunne possesseth in the Zodiacke the day aforesayd, with which signe and degree, enter this Table, and marke whether your Signe be at the head of the Table, or at the foote thereof, for if the signe be at the Head, then you must count the degr. thereof downward in the first Column at the left hand of the Table, but if the signe be at the foote of the Table, you must count the degree thereof upward, in the first Column on the right hand: and in the common angle, where the Characters of the signe and degree thereof meetes, is the degree and minutes of Declination desired.

Example.

The 20. of Aprill 1630. the place of the Sunne is 10. degrees of Taurus, I finde Taurus in the head of the Table, therefore counting 10. degrees thereof downe.

The Sea-mans Kalender.

downeward in the first Colūme on the right hand, right against 10. in the Colūme where Taurus stands, is 14 degrees 51. minutes, which is the Declination of 10. degrees of Taurus, or if the Sun, being in so many degrees of the same signe. But if the place of the Sunne haue odde minutes therewith, you must take the difference of the two nearest degrees of Declination, and worke by the proportionall parts of 60. minutes to a degree.

As for Example.

The 22. of August 1631. the true place of the Sunne is 8. degrees 27. minutes of Virgo, I finde Virgo to be in the foot of the Table, therefore in the first Colūme on the right hand, I count upwards 8. degrees, and right against the same in the Colūme where the Character of Virgo is, I finde 8. deg. 35. min. which is the Declination of 8. degrees of Virgo, but now there is the declination of 27. minutes to be either added or deduced, as the declination doth increase or decrease. To finde which, I take the difference betwixt 8. deg. 35. min. the declination of 8. degrees of Virgo, and 8. deg. 13. min. the declination of 0. degrees of Virgo, which is 22. minutes. Then I say, if 60. min. giue 22. minutes, what giues 27. min. Facit 10. min. nearest: which because the Declination doth decrease, I deduct 10 minutes from 8. degrees 35. min. and the remainder is 8. deg. 25. minutes, for the true Declination of 8. deg. 27. min of Virgo.

Againe, the 16. of Aprill 1632. the true place of the Sunne is 6. deg. 38. minutes of Taurus, I finde Taurus in the head of the Table, then counting 6. degrees downeward in the first Colūme on the left hand, right against the same under Taurus, is 13. deg. 33. min. for the declination of 6. deg. of Taurus: then for the 38. min. I take the difference betwixt 13. deg. 33. min. and 13. 53. min. the declination of 7. deg of Taurus: which is 20. minutes, then I say, If 60. giue 20. what giues 38. Facit 13. min. nearest which 13. min. I adde to 13. deg. 33. minutes, because the Declination doth increase and it makes 13. deg. 47. min. for the true declination of 6. deg. 38 minutes of Taurus. These three Examples (to the ingenious) are as good as five hundred.

The

The diuifion, parts, order, and explanation of the former Almanacke
or Ephemerides.

The first Page of the said Ephemerides, containes an Almanacke for 24. yeeres to come, shewing the Prime, Epact, Sunday letter, Leape yeere, with all the principall moueable Feasts in the whole yeere. Next followes the Twelue moneths of the yeere in order, each Moneth containing two faces, which two faces may be deuided into thre principall Sections: The first Common, the second and third Astronomicall: the first being indeed the common, because it is most needfull for all persons, consisteth of five Columes or spaces: The first day whereof, sheweth the space and houre of the Moones Change for 19. yeeres to come, the second sheweth the Number of the dayes in every Moneth: the third, the Letters ordinary for euery day of the weeke: the fourth, the Holy dayes and other Dayes of note in each moneth. Where note, that those that are obserued for Holy dayes, haue this word Fast, before them, and the first or last of the said first section, sheweth the Length of the day in houres and minutes, where the Pole is eleuated 51. degrees 45. minutes.

The second Section, containeth foure principall Parts, each part consisting of thre Columes, the foure parts being foure seuerall yeeres, each fourth yeere being Leape yeere, therein comprising the variety of the Sunnes course through the Zodiacke in the said foure yeeres. And the thre spaces or Columes in each yeere; the first, is the Dayes of each Moneth in the said yeere: the second, the True place of the Sunne answerable thereto: the third, the Declination or distance of the Sunne from the Equinotiall points of Aries and Libra, toward the Tropicall points of Cancer and Capricorne, answerable to each day of the Moneth, and to the degrees and minutes of the Sunne in the Zodiacke.

The

The Seamans-Kalender.

The reason wherefore the said Table is made for foure yeares and neether more nor lesse, is; because that every yeare is not of like equalitie of Dayes one with another: for the first yeare hath 365. Dayes and neere 6. houres: the second and third yeares being so likewise, but in the fourth yeare, the odder houres are united together, which being 4. times 6. is 24. houres very neere, making a naturall Day, which day is added to the said fourth yeare, whereby the said fourth yeare is called Leape yeare, because it hath one day more then the primary or fore-going yeares.

And so this Table being made for foure yeares, would serue for a long time, were it not that the said fourth yeare is not iust 366. dayes, but wants 20. minutes or the $\frac{1}{3}$. of an houre, or if there were a iust equality made of the dayes of the yeares, with the progresse of the Sunne through the Zodiacke, then this Table would serue for a long time without correction: but onely the Zodiacke, with the whole eight Spheares hath a certaine retrograde motion or going backward, yet so insensibly, that these Tables being gathered and calculated out of the best and truest Ephemerides for the yeares 1629. 1630. 1631. 1632. according to the true place and dayly motion of the Sunne there exactly gathered, I make no question, but that they will very well serue for 20. yeares at the least, the difference of the Sunnes place every 5. yeare is so small, being not much about 30. seconds or halfe a minute, which in 20. yeares being 5. Besextels or Leape yeares, makes 2. minutes 30. seconds: a small matter to make any difference in the Sunnes declination.

Notwithstanding which small error that can grow in so long a time, I thinke it not amisse for the satisfying of those ingenious spirits, which desire perfection, in their worke, to adde this one rule for their further satisfaction, that after these foure yeares are past, for which the said former Tables are exactly and truly calculated, to know precisely the true place of the Sunne, for any other foure yeares afterward, doe thus: Subtract 1620. from the date of the yeare in which you would know the true place of the Sun, the remainder whereof divided by 4. that which remaines upon the said division, shewes which of the 4. yeares in

The Sea-mans Kalender.

In the former Kalender seruetly to shew the Sunnes place for the yeere proposed, and if nothing remaine after the Division, then the last of the yeeres being the fourth in number, is your yeere desired: which knowne, to make an equation of the Sunnes true place, marke how many Minutes are in your Quotient, for so many minutes must be added to the Sunnes place in the said yeere formerly found for every day in the Months of May, Iune, Iuly, August, September, and October, and halfe of so many minutes in the other Months.

As for Example.

I would know the true place of the Sunne the 15. of August, in the yeere 1626. first I subtract 1620. from 1626. and there rests 6. which deuided by 4. brings 1. in the Quotient, and 2. remaines, which 2. shewes that the second of the 4. yeeres, answers to the yeere desired, & being that there is 1. in the quotient, therefore I must adde 1. minute to the place of the Sunne which is belonging to the day and yeere aforesaid, which being that to the 15. of August in the second of the yeeres, belongs 1. degree 55. minutes of Virgo, I adde 1. minute thereto, and the whole 1. degree 56. minutes is the true place of the Sunne for the day and yeere aforesaid, whose Declination answerable thereto, you shall find right against the same in the next Column towards the right hand, to be 10. degrees 51. minutes.

Againe, the 15. of March, in the yeere 1625. I desire the true place of the Sunne, therefore subtracting 1620. from 1625. rests 5. which deuided by 4. the Quotient is 1. and the remainder is 1. which remainder being 1. I must seeke for the Sunnes place in the first of the 4. yeeres, whose place there I finde for the 15. of March to be 5. degrees 6. minutes of Aries, to which, because the quotient is 1. I adde halfe thereof, which being 30. makes 5. deg. 6. min. and 30. for the Sunnes true place the 15. of March 1625. whose Declination answerable thereto, you shall finde right against the same in the next Column towards the right hand, to be 2. degrees 2. minutes Northerly.

Wherein thus much is to be noted that albeit, that in the true place of the Sunne there may be in that time so much difference, yet

The Sea-mans Kalender.

Yet in the Declination thereof there can be no sensible difference, for we see, that 3. minutes more or lesse in the true place of the Sunne, doth not produce above a minute difference of Declination, when the Sunnes Declination is swiftest, which is neere vnto the Equinotiall point, and being neere vnto the Tropickes when the Declination doth increase or decrease very slowly three or foure minutes difference in the Sunnes true place, doth not make any difference in the Declination at all: And therefore by that reason you may be well assured, that these Tables being exactly calculated for the yeares aforesaid, will serue you for a very long time without any sensible error.

The third section being the last of the second face, containeth the Names, Magnitudes, and Declinations of 54. notable fixed Starres, with their right ascension in houres and minutes, most commodious to finde the eleuation of the Pole, whose vse followeth afterward.

Propositions to bee wrought by the Ephemerides or Sea-mans Kalender, as followeth.

To know the Moones Change.

I.

TO know the day and houre of Coniunction or change of the Moone, first, looke in the first page of this Ephemerides, right against the yeare of our Lord, for the Prime number, seruing to that yeare, which number keeping in memozy, turne to the Moneth in which you desire the Change of the Moone, and in the first Colu-
me of the said Moneth vnder the title Prime, looke for the Prime number which you kept in memozy, which Prime numbers are there all in numerall Letters, and right against the said Prime number in the next Colu-
me, is the number of the Day of the Moneth on which the Moone changes: and if there be any figure
with

The Sea-mans Kalender.

with the Prime number, marke whether it be before or after the said Prime number, for if it be before, it sheweth the Moone to change so many houres before Moone: if after, it sheweth so many houres after Moone: but if there be no Figures at all with the Prime number, then the Moone changes iust at Moone.

As for Example.

In the yeare 1628. I would know in Iune upon what day and houre of the sayd Moneth the Moone changes: In the first Page being an Almanacke of 24. yeares: for the Prime, Epact, Dominicall Letter, and moueable Feasts, I finde the Prime for that yeare to be xiiij. which keeping in memory I turne to Iune, and in the first Colunne thereof vnder the Title Prime, among the numerall Letters, I seeke for xiiij. which I find right against the 21. day of the Moneth, thus xiiij. with no Figure after it, which sheweth, that in Iune 1628. the Moone changes the 21. day, iust at Moone.

Againe, in September the same yeare, the Prime xiiij. vnder the Title Prime in the Moneth of September, I finde the Prime aforesaid right against the 17. day of the Moneth, with the figure 2. after it, and further against it the third Colunne, among the Letters for the dayes of the weeke, is the Letter A. which by reason that E. is the Dominicall or Sunday Letter for that yeare, A. stands for Wednesday: So that I conclude, that in September 1628. the Moone did change the 17. day being Wednesday, 2. houres afternoone.

Of the Full and Quarters of the Moone.

2.

The next thing to be considered herein, is the first Quarter: the Full Moone, and the last Quarter thereof, which is thus done: To the time of her Change adde 7. dayes and 6. houres, sheweth the first Quarter: that doubled shewes the Opposition or Full: and thereto againe the said 7. dayes, 6. houres added, makes the time of the last Quarter.

To

The Sea-mans Kalender.

To know what Signe the Moone is in.

3.

A third thing needfull to be knowne, is in what Signe the Moone is at all times, which may thus be done: vpon the Change day next before your day required, looke in the second section of the Ephemerides vnder the yeare desired, and the Coluine of the place of the Sunne for the day and yeare, what Signe and degree thereof the Sunne was in vpon the said day of the Coniunction, for then were the Sunne and Moone both in one Signe and degree, and to know what Signe she is in any day after, multiply her age by 12. which is the meane motion of the Moone: and from the day of the Coniunction, in the Coluine of the true place of the Sunne, tell forward if the number be so great, out of the Moneth to the next, till you haue told the number of the product of the Moones age, multiplied by 12. and where the said product number ends, is the signe and degree of the Moone.

Example.

The 16. of October 1629. I desire the same, in which Moneth by the first Proposition I find the Moone to change the 6. day iust at Moone, and being that 1629. is the first yeare, after the Leape yeare, in October vnder the title First yeare, I seeke the 6. day in the first Coluine thereof, and right against it toward the right hand is 23. degrees 9. minutes of \cap , in which signe and degree both the \odot and \odot , were at their \odot , or change. then counting from the said 6. day to the 16. day is 10. dayes for the Moones age, but for her true place, according to your rule before directed vnto you, I count forward from the 6. day or \odot . to 10. more, which being 10. times 12. or 120. the said number of 120. ends vpon the 3. of February, against which is in the next Coluine of the Sunnes true place 25. degrees 11. minutes of ♊ . Therefore I conclude the Moone to be in 25. deg. 11. minutes of ♊ the day and time proposed: otherwise, if you multiply the Moones age by 2. and diuide the product by 5. the Quotient shewes the whole signe, and the remainder so many times 6. degrees as the Moone is gone from that place of the Zodiacke where she was in the Coniunction.

The

The Sea-mans Kalender.

The Moones comming to the Meridian, with the
time of her rising and setting.

Multiply the Moones age by 12. and divide the Product by 15.
the Quotient sheweth the houre of the Moones being South, and
if any thing remaine after the diuision, for euery unitie that re-
maines adde 4. minutes, because 15. degrees make an houre of
time, and 4. minutes a degree. That knowne, learne by the third
Proposition what signe the Moone is in, and then looke out in the
second section, what time and Day of the yeare the Sunne posses-
seth the same Signe and Degree thereof, and right against the said
Day in the last Column of the first section, vnder the Title Length
of the Day, is the length of the day, the Sunne being in the same
Signe in houres and minutes: halfe that number of the dayes
length taken from the time of the Moones being South, sheweth
her rising, and the said halfe added to the time of her being South,
sheweth her setting.

Example.

The 16. of October 1629. I find the Moone to Change the 6.
day at Poone, and the number of dayes betwixt that and the 16.
day is 10. for the Moones age, then multiplying 10. the Moones
age by 12. her meane motion, the Product being 120. divided
by 15. the degr. answering to an houre of time, the Quotient is
8. which shewes the Moone to be vpon the Meridian or at South
at 8. of the Clocke that Night: then by the third Proposition or
former example, I find the Moone to be in 25. degrees 11. minut.
of Aquarius, and the Sunne being in the same signe, degr. and min.
the Diurnall arch or length of the Day being then 9. houres, 37.
minutes, is the continuance of the Moone likewise, in her eyther
Diurnall or Nocturnall arch, the $\frac{1}{2}$. thereof taken from her being
vpon the Meridian, leaueth her rising. and likewise the other
halfe added to the time of her being vpon the Meridian, sheweth
her

The Sea-mans Kalender.

her setting. Thus you see that the day and yere aforesaid, the Moone shall here in our Horizon rise at 4. a Clocke afternoone: she shall be South, or vpon the Meridian, at 8. a Clocke afternoone: she shall set at 12. a Clocke at night: and her continuance aboue the Horizon, or shining to vs is 8. houres.

This is a very necessary thing to be knowne for by her being vpon any other point of the Compasse, you may giue a very nere guesse, at euery houre of the night.

The next thing to be considered in the first section, is the Festi- uall dayes, and other dayes of note, which are so common that they neede no explanation. Onely this: before euery Feast which is kept Holiday. is set this word Fast.

To know the length of the Day, or the length of the Night, with the rising and setting of the Sunne.

5.

All this is perfozmed by the last Columne of the first section thus: Right against the day of the Moneth desired in the last Columne of the sayd first section, vnder the Title Length of the Day, is the length of the day desired, in houres and minutes, which number subtracted from 24. the length of the naturall day, leaues the length of the night: and halfe the sayd number taken from noone, leaues the houre of the Sunne rising: the other halfe of the day added to noone, sheweth the Sunnes setting.

Example.

The 19. of October in the yere 1631. vnder the Title Length of the Day, right against the said 19. day, is 9. hour. 36. mi. the length of the day, which 9. hou. 36. mi. taken from 24. hou. leaues 14. hou. 24. min for the length of the night: Then the halfe of 9. hour. 36. min. which is 4. hou. 48. min. taken from noone, leaues 7. hour. 12. min. for the Sun rising. The same 4. hou. 48. min added to noone: makes 16. hou. 48. min. which is 4. hour. 48. minutes after noone.

The Sea-mans Kalender.

By which you see, that the 19. of October, the length of the day is 9. houres 26. min. the length of the night 14. houres 24. minutes: the Sunne riseth 12. minutes. after 7. in the morning, and setteth 48. min. after 4. in the evening.

Thus much for the first section: the second section being foure parts seruing for foure severall yeeres, every part having three Columns: the first the day of the Moneth, the second the true place of the Sunne, and the third the Declination of the Sunne agreeing thereto, all the three partes being of like quality, which are so plaine and commonly knowne, that they neede no further distinction, albeit that the uses thereof are manifold, and commodities excellent: For there are few propositions concerning the Sphaere, which can be wrought without the true place of the Sun knowne, and being so much use for it, there are few meanes for the true knowledge thereof, but onely by the Ephemerides, which every one cannot haue.

And for that cause I haue transferred the true place of the Sun in degrees and minutes, out of the best Ephemerides into this former Kalender, where it is ready for such as desire the same, or as haue occasion to use the same, in working conclusions, or making of Instruments Mathematicall: but most cheifly I haue here placed it, to the end that those that stand in doubt of the trueth of those Tables of the Sunnes Declination, may at their owne pleasure make tryall thereof. The order how to doe the same, is set downe in the first printed page after the said Tables: for by the true place of the Sunne, is found his Declination, either North or South: and by his Declination, and obseruation of the Sunnes Altitude vpon the Meridian, is knowne the height of the Pole or Latitude of the place where you are.

How to vse the Sunnes Declination, thereby to
find out the eleuation of the Pole.

6.

To finde out the Altitude or height of the Poles, in any seuerall
call

The Sea-mans Kalender.

rall Latitude, viz. How much the Pole is rayſed aboue your
 Horizon in degrees and minutes, It is neceſſary firſt to take by
 obſervation, the Meridian Altitude of the Sunne, which Meridian
 Altitude is knowne, by taking the height of the Sunne, that day, in
 which you would obſerue iuſt at noone: at which time the Sunne
 is higheſt, being then alſo vpon the Meridian: which found, note it
 downe in paper or ſlate: Then knowing the yeere of our Lord, with
 the Month in which you are, and alſo the day of the Month, looke in
 the Kalender before ſpoken of, for the Month and day thereof, and
 right againſt the ſaid day of the Month toward the right hand, vnder
 title Declination of the Sun, you ſhall ſee the ſeueral yeeres, which
 the ſaid Tables of Declination ſerue for. If it be the Leape yeere,
 looke in the laſt of the ſaid foure Tables vnder the Title Leape
 yeere: If it be the firſt yeere after the Leape yeere, then reſort to
 the firſt of the ſaid Tables vnder the title Firſt: and ſo of the ſecond
 and third and after thoſe 4. yeeres are paſt, come backe againe to
 the firſt, & proceed as you did before: then (as I ſaid) hauing found
 out the Month, day, and yeere, direct your eye downeward toward
 the ſote of the Table, in that Table which ſerues to the yeere pro-
 poſed, till you find a number making a right angle, with the day of
 your Month: or more plainely, looke what number in the laſt Co-
 lumne of your yeere, is right againſt the day of your Month: which
 numbers are the declination for the day deſired: and being 2. num-
 bers in the ſaid Columne, the firſt are deg. the other minutes: then
 regard alſo, whether the Sunne hath N. declination or S. declinati-
 on, which is ſet downe betwene the ſeueral ſpaces: where by the
 way you ſhall note, that from the Suns entrance into Aries, which
 is the 11. of March, till his entrance into Libra, the 13. of Septem-
 ber, he hath N. declination: and from the ſaid 13. of September
 till his entrance into Aries againe, S. declination: the ſaid decli-
 nation increaſing according to the Sunnes progreſſe through the
 ſignes, from his entrance into Aries, till his entrance into Cancer,
 & decreaſing from Cancer, to the beginning of Libra. Then againe
 increaſing from Libra to Capricorne, and decreaſing from Capri-
 corne to the end of Piſces, and beginning of Aries. Aries, Taurus,
 Gemini, Cancer, Leo, and Virgo, being ſignes hauing North decli-

The Sea-mans Kalender.

nation from the Equinoctiall Circle: and Libra, Scorpio, Sagitarius, Capricornus, Aquarius, and Pisces. South signes having South declination from the Circle: then knowing (as I haue said) the Meridian Altitude of the Sun, the Declination of the Sun, and whether the Sunne hath South or North Declination, as these three things are alwayes to be considered, in knowing the height of the Pole. If the Declination be North, subtract the Declination from the Meridian Altitude, the remainder is the Elevation of the intersection or cutting of the Equinoctiall with the Meridian above the Horizon, which in common tearmes is the Elevation of the Equinoctiall above the Horizon: which height of the Equinoctiall, taken from 90. leaueth the height of the Pole, or the Latitude of the place of your obseruation. But contrarywise, if the Sunne hath South Declination, adde the sayd Declination to the Meridian Altitude, the Product is the height of the Equinoctiall, which likewise taken from 90. leaueth also the height of the Pole.

Example.

I obserued the 11. of July 1628. in the City of London, and found the Meridian Altitude of the Sunne to be 58. degrees, 56. minutes, and the Declination of the Sunne North 20. degrees, 28. minutes: Being that the Declination was North, I subtracted 20. deg. 28. min. the Declination of the Sunne at noone: the remainder was 38. degr. 28. minut. the height of the Equinoctiall: that taken from 90. leaues 51. degr. 32. min. for the height of the Pole, or Latitude of London.

This rule is to be vnderstood, when you are betwene the Equinoctiall and the North Pole, and the Sunne to be Southward of you: But if you should be betwene the Equinoctiall and the South Pole, and the Sunne North from you, then you must worke contrary: for then if the Sunne hath South Declination, you must subtract the declination from the Meridian Altitude, and if the Sunne hath North Declination, you must adde the said Declination to the Meridian Altitude,

For

The Sea-mans Kalender.

As for Example.

Being at Sea to the Southwards of the Line, the 4. of January 1628. suppose that you obserue the height of the Sunne at noone, and find it to be 66. deg. 20. min. then you shall find the Declination to be 21. de. 24. min. to the Southwards, which subtracted from 66. deg. 20. min. the Meridian Altitude leaues 44. deg. 56. min. for the height of the Equinotiall, that taken from 90. rests 45. deg. 4. minutes, for the height of the South Pole aboue the Horizon.

Againe, suppose that being at sea, the 10. of May 1628. and obseruing the Sunne, you take the Altitude at noone 60. deg. 30. min. and his Declination then is 20. deg. 10. min. Northwards; but then not hauing obserued long before, you know not whether you are to the Northwards of the Equinotiall, or to the Southwards of the said Line: to know which, set the Sun by your Compasse, and marke which way the Shadow of the Sun strecketh: for if he casteth his shadow the same way that the Declination is, then is the Sun betwixt the Equinotiall and you. Your selfe being also the same way that the Sunnes Declination is: and therefore subtracting the Declination 20. deg. 10. min. from 60. deg. 30. min. the Meridian Altitude: : rests 40. d. 20. min. the height of the Equinotiall, the complement whereof 49. degrees. 40. min. is the eleuation of the North Pole: but if the Sunne casts his shadow contrary to his Declination, that is to say: If hauing North declination his shadow goeth Southward, or hauing South declination, casts his shadow Northward: Then either the Equinotiall shall be betwixt you and the Sunne, or you in the Equinotiall: or else you shall be betwixt the Equinotiall and the Sunne: which to know, adde the Declination and the Meridian Altitude for the day proposed together: If the summe of the addition be lesse then 90. degrees, so much as it wanteth of 90. degrees, shall you be distant from the Equinotiall, that way which the shadow strecketh: If it be iust 90. deg. then are you vnder the Equinotiall. Againe, if your said Meridian Altitude and Declination added, passeth 90. degrees, then so much as is ouerplus, shall you be from the Equinotiall toward the

The Sea-mans Kalender.

Sunne, and then also you shall be betwixt the Equinoctiall and the Sunne, and if you find the Sunne to be in your Zenith, so much as is the declination shall you be from the Equinoctiall, that way that the Sunne declineth: By which reason, if the Sunne be in your Zenith, that is 90. deg. high, and hath no Declination, then are you vnder the Equinoctiall.

How to appropriate the Tables of Declination
to any other Meridian.

There is in the vsing of the Sunnes Declination one principall thing to be considered: which is, that a Table of Declination made for any particular place, doth not serue generally for all places, but onely for such places as haue the like, or neere the same Longit: The reason is, because that the Declination is calculated according to the true place of the Sunne at noone, at which time the Sunne is vpon the Meridian at that place for which the said tables are made. But you must note that the Sunne doth not come to the Meridian in all places at a like time, although that in all places the Sunne being vpon y Meridian, makes the middle of the day. But for euery 15. deg. difference of Longit. betweene any two places, the Sun comes sooner or later to the Meridian by so many houres. For if y place of 15. deg. to the Eastward of the place preferred, then the Sun comes sooner to the Meridian by an houre, and if it be 15. deg. to the Westward later by an houre. And so consequently more or lesse according to the difference of the Longit. By which reason, in what part of the world soeuer you be, you may worke for the Declination of the Sunne in that place, by the proportionall parts of 24. houres Declination, to the houre of difference in Longitude.

As for Example.

Being in Brasilia (a part of the West Indies) the 10. of Aprill this yere 1628. whose Meridian is distant from the Meridian of England to the Westward, about 45. deg. which is 3. houres of time that y Sunne should come to y Meridian later there the here at London where the Table is made: For when it is 12. a clocke here, it is but 9. there, and being noone there, it is 3. a clocke here.

Therefore

The Sea-mans Kalender.

Wherefore to apply this Table to that place, I finde the Declination for the day aforesaid, under our Meridian to be 11. degr. 43. min. at none, and by reason that when it is 12. a clocke at Brasilia, it is then at London 3. houres past. Wherefore by the rule of proportion, I seeke what declination the sun hath at 3. a clocke afternone as followeth. I take the difference of declination betwene the day aforesaid, and the next following, which is 20. min. then I say by the rule of 3. if 24. houres giue 20. min. what giues 3. houres, the time of the difference of Longit. Facit 2. min. and 30. seconds, which (because the declination increases) I adde to the number of the day proposed: so I conclude the declination of the Sunne to be the 10. of Aprill at none, in the Kingdome of Brasilia, 11. degrees, 45 minutes and $\frac{1}{3}$.

Againe, the day and time aforesaid, in the Bay of St. Sebastian, whose Longit. is 58. degrees to y^e Eastward of London, answering nere to 4. houres of times, shewing that the Sunne comes sooner to the Meridian in the Bay of St. Sebastian, by 4. houres then at London, by which reason the declin. is lesse there, then at London because the declination doth increase: For if y^e declination did decrease, it would be moze there then at London: and to knowe the declination of the Sunne in the Bay aforesaid: I take the difference betwixt the declination of the 10. of Aprill, & the declination of the day next before, being 20. min. Then (I say) if 24. houres giues 20. min. what 4. houres Facit 3. min. which deducted from 11. deg. 43. min. the declination of the Sunne the 10. of Aprill aforesaid at London, leaueth 11. deg. 40. min. The declination of the Sunne at none: in the Bay of Saint Sebastian, being that when it is 12. of the clock there, it is but 8. a clocke at London: or in any place hauing the same Longitude.

How to obserue the helght of the Pole by the Starres.

THE working hereof by the Starres, to find the height of the Pole, is all alike with the working thereof by the Sunne: for if you obserue any Starre vpon the Meridian, looke in the third

The Sea-mans Kalender.

or last section of the Ephemerides, amongst the Moneths for the name of the Starre which you obserued, wherewith you shall find his Declination either *N.* or *S.* and the right ascension thereof in houres and min. and hauing taken the Altitude of any Starre vpon the Meridian, you haue nothing to marke in the Table for this but the Declination, which if it be *Nor*th, take the Declination of the Starre from the height thereof: The remainder taken from 90. leaueth the height of the Pole: but if the Starre haue South Declination, adde the Declination to the Altitude taken, and the *Pro*duct thereof taken from 9. leaues the height of the Pole: Also to find the time of any Starres coming to the Meridian, is set downe after the Tables of the Sunnes right ascension.

Example.

The 25. of Nouember 1628. I obserued a Starre of the second bignes in the shoulder of Pegasus, or the Flying-horse, about 8. of the clocke in the Euening, and found the Meridian Altitude thereof to be 51. deg. 26. min. and in the Kalender, in the second Face thereof I find the said Starre to haue 12. deg. 58 min. *Nor*th Declination which taken from 51. deg. 26. min. the height obserued leaues 38. deg. 28. min. the height of the Equinotiall: the complement whereof of 51. deg. 32. min. is the height of the *Nor*th Pole at London.

And so consequently for all those Starres whose Declination is taken from the Equinotiall: but for those Starres which are any thing nere to the Pole, whose distance or Declination is counted from the Pole, their working is thus: You must note, that being any thing farre to the *Nor*thward, some of those Starres will be twice vpon the Meridian, viz. once aboue the Pole, and once vnder the Pole: Therefore if you obserue any Starre vpon the Meridian vnder the Pole, adde the distance of the said Starre from the Pole to your Altitude obserued, the totall is the height of the Pole: But if you obserue any Starre vpon the Meridian aboue the Pole, so much as is the distance or Declination of the said Starre from the Pole, you must take from the Altitude taken, the remainer is the height of the Pole.

As.

The Sea-mans Kalender.

As for Example.

If at London you obserue the former Guard-Starre beneath the Pole vpon the Meridian, you shall find it to be 37. degrees 21. minutes, to which if you adde 14. degrees 11. minutes., the distance of the said Starre from the Pole, the totall is 51. degrees 32. minutes, the height of the North Pole at London. Again the same Starre obserued vpon the Meridian aboue the Pole is 65. degrees 43. minutes, from which 14. degrees 11. minutes the distance aforesaid taken, leaueth 51. degrees 32. minutes, as before.

Note that being farre Northward, those Starres betwene the Equinotiall and the Tropike of Cancer, are best to obserue, and being betwene the said Tropike and the Equinotiall, those Starres aboue the Pole are fittest for obseruation, and for those that trauaile farre beyond the Line to the Southwards: the like order must be kept by the Starres, betwene the Equinotiall and the Tropick of Capricornus, and those that are nere the South Pole.

And whereas the North Starre it selfe being very nere vnto the Pole, is the fittest Starre for to be obserued by reason of the nerenesse thereto, I haue for your further ease, made an exact Table for the Declination of the North Star, from the Diameter of the Poles Circle, described by the North Starre, which may be also, or rather called the Elevation or depression vpon euery point of the Compasse, being very commodious, by reason whereas the other Starres are onely to be obserued vpon the Meridian. This said North Starre by the helpe of this Table following, may be obserued at any time of the night. whose vse followeth after the said Table.

The Sea-mans Kalender.

		Points of the Com- passe.		Degrees	Minutes	Of Declination
If the guards be	Then the Load star is	N.W.b.W.		0	0	Vnder the Pole.
		Northwest.		0	34	
		M.W.by N.		1	6	
		N.N.W.		1	36	
		N.by W.		2	4	
		North.		2	24	
		N.by E.		2	40	
		N.N.E.		2	50	
		N.E.by N.		2	52	
		Northeast.		2	50	
If the guards be	Then the Load star is	N.E.by E.		2	40	Above the Pole.
		E.N.E.		2	24	
		E.by N.		2	4	
		East.		1	37	
		E.by S.		1	6	
		E.S.E.		0	34	
		S.E.by E.		0	0	
		Southeast.		0	34	
		S.E.by S.		1	6	
		S.S.E.		1	36	
If the guards be	Then the Load star is	S.by E.		2	4	Above the Pole.
		South.		2	24	
		S.by W.		2	40	
		S.W.		2	50	
		S.W.by S.		2	52	
		Southwest.		2	50	
		S.W.by W.		2	40	
		W.S.W.		2	24	
		W.by S.		2	4	
		West.		1	36	
		W.by N.		1	6	
		W.N.W.		0	34	

This former Table sheweth how much the North Star is, eyther above or beneath the Pole, the Guards being vpon any point of the Compasse.

The use of which Table is thus: having obserued the Altitude of the North Starre, marke so neere as you may, vpon what point of the Compasse the Guards then are: which knowne, resort to this Table, and finding there in the said point vpon which the Guards were at your obseruation, right against the same is the number of degrees and minutes, which the Starre is either above or beneath the Pole, which number so found, if it bee above the Pole, must be subtracted from your Altitude taken, and if vnder the Pole, it must be added to the sayd Altitude taken: which so tall added, or remaines subtracted, is the true height of the Pole it selfe.

As

The Sea-mans Kalender.

As for Example.

Observing the North Starre to be 58. deg. 30. min. when the Guards are at the Northeast, I looke in the Table for the North east point of the Compasse, & right against the same I find 2. deg. 50. min. under the Pole, which being that the North Starre is under the Pole, I adde his declination 2. deg. 50. min. to 50. deg. 30. min. his Altitude obserued, and the totall 61. deg. 20. minutes, is the iust height of the Pole it selfe in that place.

Againe, observing the North Starre to bee 50. degrees 15. min. aboue the Horizon, when the Guards are vpon the Southeast point of the Compasse, I looke for southeast in the Table, and right against the same is 34. minutes aboue the Pole, which being that the Starre is then so much higher then the Pole it selfe, I subtract 34. minutes, the Declination of the Starre from 50. deg. 15. min. the Altitude taken and the remainer 49. degrees, 41 minutes, is the perfit height of the Pole aboue the Horizon in the said place of obseruation.

And now having made plaine vnto you the vse and profit of the said Table, it being indeed so necessary and commodious for the Mariners vse, as any rule whatsoeuer, it resteth now to speake somewhat more particularly of the other fixed Starres, set downe in the former Kalender or Ephemerides, whose vse is manifold and very excellent, but their vse for the finding of the Poles eleuation by their declination, obserued at there being vpon the Meridian being formerly shewed, it is onely requisite to explaine vnto you a briefe and easie methode for the exact and ready finding of the true time of any of the fixed Starres comming to the Meridian, at which time they are onely fit for to be obserued: for the knowledge whereof, I haue here placed a Table of the right ascension of the Sunne for euery day of each Moneth throughout the whole yere, according to his true place for euery of the said dayes formerly set downe in the Kalender or Ephemerides: the vse whereof followeth after the said Table.

A Table

A Table of the Sunnes.

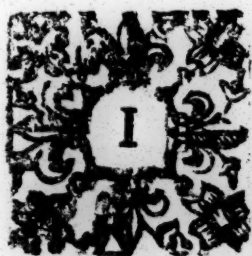
Dayes.	Ianua.		Febru.		March.		Aprill.		May.		Iune.	
	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
1	19	30	21	39	23	25	1	16	3	11	5	15
2		34		43		28		20		15		19
3		39		47		32		25		19		23
4		43		50		36		29		23		27
5		47		54		40		33		27		31
6		52		58		44		36		30		36
7		56		2		47		40		34		40
8	20	0	22	6		51		43		38		45
9		4		9		55		47		42		49
10		8		14		58		51		46		53
11		13		18	0	2		55		50		57
12		17		21		6		58		54	6	1
13		22		25		9	2	2		58		5
14		26		29		12		6	4	2		9
15		30		32		16		10		7		13
16		34		36		20		14		11		18
17		38		40		23		18		15		22
18		42		44		27		22		19		26
19		46		48		31		26		23		30
20		50		52		35		30		27		34
21		54		56		38		33		31		38
22		58		59		42		37		35		42
23	21	3	23	3		46		41		39		46
24		7		7		49		44		43		51
25		11		10		53		48		47		55
26		15		14		57		52		51		59
27		19		18	1	0	3	56		56	7	3
28		23		23		3		0	5	0		7
29		27				7		4		3		11
30		31				11		7		4		15
31		35				15				11		

right ascension in Houres and Minutes.

Dayes.	Iuly.		August		Septem		O. tob.		Noue m		Decéb.	
	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
1	7	19	9	22	11	16	13	5	15	5	17	12
2		23		26		20		8		9		17
3		27		36		23		12		13		21
4		31		33		27		16		17		25
5		35		36		30		19		21		30
6		40		40		33		23		25		34
7		44		44		37		27		29		39
8		48		48		41		31		33		43
9		52		52		44		34		37		47
10		56		56		48		38		42		52
11		0		59		52		42		46		56
12	8	4		3		55		45		50	18	0
13		8	10	7		59		49		54		5
14		12		11	12	3		53		58		10
15		16		15		7		57	16	3		14
16		20		18		11	14	1		7		18
17		04		22		14		5		11		23
18		28		26		18		9		16		27
19		31		29		22		13		20		32
20		35		33		25		17		24		36
21		39		36		29		20		28		41
22		43		40		30		24		33		45
23		47		44		36		28		37		50
24		51		47		40		32		14		55
25		55		51		43		36		46		59
26		59		54		47		40		50	19	3
27	9	3		59		51		44		55		7
28		7	11	2		54		48		59		11
29		11		6		58		52	17	3		16
30		15		9	13	2		57		8		21
31		19		13		15	1					25



A Declaration of the former Table.



Thinke it not amisse, before I shew the vse of the former Table of right ascension, for the finding of the time of any starres comming to the Meridian, to explaine vnto you what we call right ascension. Know therefore, that in the Spheare there is right ascension, Oblique ascension, and meane ascension, which haue all severall definitions: but the rest being impertinent, I will onely speake of right ascension which is thus defined: Right ascension is that portion of the Equinoctiall which commeth to the Meridian, of some stead with any starre, or any part of the Eccipticke, or more plainly, it is that number of degrees of the Equinoctiall, comprised betwixt the Vernal Equinoctiall point, or intersection of the said Equinoctiall Circle, and the first minute of Aries, and that starre or part of the Eccipticke, which is vpon the Meridian at the day or time desired. As for your better vnderstanding, if the beginning of Aries be vpon the Meridian, or any point or starre in the said beginning of Aries, then hath the said point or starre so situated, no right ascension at all, by reason that the beginning of the Equinoctiall commeth to the Meridian therewith: But if the beginning of Cancer, or any starre in that situation be vpon the Meridian, then is there with it vnder the same Meridian 90. degrees of the Equinoctiall, or like houres of time, being that every 15. degrees of the Equinoctiall answers to one houre of time, shewing that that starre or point, which is in the beginning of Aries, shall come to the Meridian 6. houres sooner then that other which is in the beginning of Cancer, and so of others: I doubt not
but

The Sea-mans Kalender.

but that these few words will suffice to giue you the better light to that which followes. First therefore, to find the right ascention of the Sunne at any time, looke for the Moneth in the head of the Table, & for the day of the Month at the left side of that face, where the Month desired is, and in the common Angle answering to them both : is the houre and minute of the Sunnes right ascention.

As for Example.

I desire the right ascention of the Sun, the 25. of May : first in the head of the Table I looke for May, which found in the first Colunne on the left hand, I looke for 25. & right against the same in the common Angle, vnder the title May, I find 4. houres and 47. min. for the right ascention of the Sunne the said 25. of May.

These things thus knowne and considered, it is to be noted, that whereas the Sunne hath a different number for his right ascention euery day, and the Starres keepe euery one still alike number for his peculiar right ascention, the reason thereof is this.

The Starres are all fixed in the eight Spheare, in which eight Spheare is also the Zodiacke placed, not onely to limit the course and progresse of the Sunne in his continuall motion, but also to giue a certaine limitation to the Starres, who being fixed in any part of the Heauens, that certaine Meridian or Circle of South and North, which passeth through the Center of any Starre cutteth also in one place or other of the said Zodiacke : which number of degrees so put in the Zodiacke, is the Longitude or distance of the said Starre from the beginning of Aries : Now the Star (as I said) being so fixed hath no motion, but onely as the whole frame of the Zodiacke with the right Spheare, and all the Circles and Starres therein placed, which as is apparent to the sight, is by the first mouer carried round about from East to West in 24. houres : but the Naturall motion of the said eight Spheare, being from the West to the East, is so slowe, that it is insensible, whereas the Sunne being of a very swift motion, in comparison of the former, his motion being euery 24. houres, nere vpon a
deg.

The Sea-mans Kalender.

degrée litle moze or lesse, makes his motion from the M. to the E. in the Zodiack most apparant in his motion, also descri: ing the Zodiacke Circle, as neuer declining from the middle thereof: And further, the Sunne being the ruler of the Day, and directo: of the Night, is the sole and onely distinguisher of Time: For this is apparent to the view of euery one, that the Sun being vpon the Meridian, aboue the Horizon, makes the middle of the Day, and being vpon the Meridian vnder the Horizon, makes also the middle of the Night: which being (as I haue said) that the Sun comes alwaies to the Meridian iust at 12. a Clocke, it followes necessarily, that what starre or point in the Zodiacke soeuer, hath greater Longit. then the Sun, his right ascension is also greater then the Sunnes: and looke how much the said right ascension is moze then the Sun, by so much later then the Sunne must the said starre or point come to the sayd Meridian. Proportionally after 15. degr. to an houre, and 1. degré to 4. minutes of time.

Take this therefore for a generall rule. that if the right ascension of the starre, whose time of comming to the Meridian you desire to know, be greater then the right ascension of the Sunne, subtract the Sunnes right ascension from the sayd starres right ascension, and the remainder (if it be lesse then 12.) is the houre & minute that the starre comes to the Meridian afternoone: and if the remainder be moze then 12. subtract 12. also, and the remainder showes so many houres and minutes after midnight: But if the Sunnes right ascension be greater then the starres right ascension, then adde 24. houres to the starres right ascension, and subtract the Sunnes right ascension therefrom, as befoze, the remainder shewes the starres comming to the Meridian afternoone: If it be lesse then 12. or if it be moze then 12. 12. also subtract, the remainder showes so many houres and minutes after midnight.

As for Example.

The 15. of Nouember, I desire to know at what time Oculus Tauri (or the Bulls eye) will be vpon the Meridian: first in the former Table of the Sunnes right ascension, I looke for the 15. of
Nouember

The Sea-mans Kalender.

November, where I finde the Sunnes right ascension for that day to be 16. houres and 3. minut. and in the Kalender of Ephemerides among the fixed Starres, I finde the right ascension of the Bulls eye to be 4. houres 13. min. which being lesse then the Sunnes right ascension, I adde 24 houres to 4. houres, 13. min. and from the totall 28. houres 13. min. subtracting 16. houres 3. minutes the Sunnes right ascension, rests 12. houres, 10. minutes, which being more then 12. houres, I take away also 12. houres, and so there rests 10. min. after midnight, that Oculus Tauri comes to the Meridian the said 15. of November.

Againe, the 10. of Aprill, I would know at what time the Lyons taylor will be upon the Meridian: In this Table I finde the Sunnes right ascension, the day aforesaid, to be one houre 51. min. and in the Kalender I finde the right ascension of the Lyons taylor to be 11. houres 29. minutes. Then subtracting one houre 51. minutes, the Sunnes right ascension, from 11. houres 29. minutes, the Starres right ascension, rests 9. houres 38. minutes, shewing that 38. minut. after 9. a clocke at night, the said Starre shall be upon the Meridian.

The Monethly time of each Starres being in rule for obseruation.

January.

Oculus Tauri, the whole constellation of Oryon, Hyrcus, the Goat, the great Dog, the little Dog, the greatest part of Leo, the Crofiers, Canopus and the South Triangle.

February.

The whole Constellation of Leo, Arcturus, the Centaure, and the Virgins Spike.

March.

The hidden part of Leo, Hydra, Virgins Spike, the Centaure, Arcturus, the Balance, and Scorpio.

Aprill.

The Centaure, Balance, Scorpio, Lyra, and Sagittarius.

G

May

The Sea-mans Kalender.

May.

Scorpio, Lyra, South Crowne, and Eagles heart.

June.

South Crowne, Eagles heart, Swans tayle, and the Dolphin.

July.

The Dolphin, Fornahand, and Pegasus shoulder.

August.

Fornahand, Pegasus, Cassiopeia, Andromeda, the Whale, and the Ram.

September.

Cassiopeia, Andromeda, the Whale, the Ramme, Medusa, Perseus, and Eridanus.

October.

All the former of September, and October Oculus Tauri, Oryon, Hyrcus, and the great Dog, the Crofiers, and Canopus.

November.

All the former of October, with November, the little Dog, and the South tryangle.

December.

The Whale, the Ramme, Medusa, Perseus, Eridanus, Oculus Tauri, Hyrcus, Oryon, Canopus, great Dog, little Dog, Hydra, and Leo, in the Moneths aforesaid, at one time or other of the Night, these Starres are vpon the Meridian.

Having sufficiently explained vnto you, the manner and way how both by the Sunne and Starres to attaine to the true height of the Pole or Latitude of any place: I purpose now (God willing) to speake somewhat of the Longitude: which as the former is most easie, and the finding thereof knowne almost to all Seamen, so is the other as vncertaine, and hath not yet hitherto bene found out or knowne exactly to any, albeit, that many Learned men and of great experience haue laboured very earnestly for the same, and many good meanes haue they inuented, as helpes and assistance vnto Mariners in their long Nauigations and Trauels, by which though with great labour, care and industry, they transport themselves to the most Regions of the world: with farre more ease and facility they might doe it, if they could as perfectly

The Sea-mans Kalender.

perfectly and readily finde the Longitude at all times, as there may the Latitude: for then hauing sayled many dayes in the knowne pathes vpon the large and spacious Seas, and enduring all those vn-indurable troubles, miseries, and vnspokeable calamities, which doe for the most part attend vpon Long-voyages: yet after all this, if vpon the first faire opportunitie, they could readily with the Latitude, finde also the Longitude, their forepassed troubles would bee ioyfully remedied, being that these two (like louing sisters) would apply such pleasing comfort to their cold stomakes, after their tedious trauels, by giuing them the true picke or place of their then present being. Peter Appian, and Gemma Frisius, haue written thereof, as also some others: but truly in my opinion, it was neuer brought to such exquisite perfection, as it is now a dayes: and for mee to write thereof, were but as it were to set vp a Candle at noon dayes, rather to shew mine owne folly, then to lighten those that know a better way then my selfe: in which doing, well may Appelles saying, Nec furor ultra crepidam, be applyed vnto me, but for my excuse I doe intreat the Iudicious to perswade themselves, that it is faire from my thought to set downe any thing in this for a president vnto them, but onely in good will to shew my opinion thereof, to the Ignorant, being as followeth.

First, therefore the Latitude being knowne: by finding the Longitude also, you haue the true picke or place in the Globe, or Carde, where your Ship is, which to finde nearest, is two wayes, one by dead Reckoning, the other by Obseruation: But dead Reckoning (as they call it) being as I take it m. & v. ed, I will speake first thereof, by which if it were possible that this Reckoning could exactly and precisely be kept, it would giue both Latitude and Longitude without any obseruation at all: The different Latitude being onely the distance that the Ship is departed from the Paralell where shee last was eyther Northward or Southward: and Longitude being the distance that shee is departed from the Meridian, eyther Eastward or Westward: for the knowledge whereof, the e things are principally to be considered.

The Sea-mans Kalender.

First, the true prick or place of the Ships being at the beginning of the voyage.

Secondly, a sound and experient iudgement of the way that the ship maketh, with euery swift wind

Thirdly, to know exactly how much the Compasse doth vary from the true North or South point, vpon which the Needle is taught eyther Eastward or Westward, in as many severall places as conveniently may be obserued.

Fourthly, to note diligently the Floods or Currents, which may cause the Ships way to be more Leeward, or otherwise then expectation, and to giue allowance of her course and way accordingly.

Fifthly, the severall points of the Compasse that she makes her coursegood vpon, and what way she hath made vpon euery point.

Sixthly, to bring those severall courses into one straight line, thereby to know what course she hath made good, with the nearest distance vpon the said point or Kombe, that she hath made her way good vpon.

And lastly, knowing how many leagues both raise or lay a degree vpon the sayd Kombe, the true reckoning of your said course and distance, giues you the difference of Latitude or Paralell where the Ship then is: and also knowing how many leagues answer to a degree of East and West in the sayd Paralell, the course, distance and Latitude giues the difference of Longitude or the Meridian, vnder which the Ship then is, the intersection of which said Paralell and Meridian, is the prick or place of the Ships then being, of which things I will speake more particularly afterward.

Now it resteth to speake something of knowing the Longitude onely by obseruation, which is very necessary to bee knowne, that thereby the one may make tryall of the other, being that if the account by dead reckoning, and also by obseruation doe both agree in the Latitude and Longitude, then may you be well assured, that you know truly the place where you then are, which Longitude by obseruation is thus knowne: prepare a very perfect and true running glasse, which may precisely runne 24. houres without error, and about the time that you purpose to set sayle, set the sayd glasse

The Sea-mans Kalender.

of the Compasse, from the true North or South : but if the Sunne be eyther to the Northward or Southward of the Equinotiall, hauing amplitude: then is there a respect also to be had to the Sunnes amplitude : as thus, if the Sunne haue North or South amplitude, and that you obserue the Sunne to rise or set so much from the E. or W. point of the Compasse as is the Sunnes amplitude, and likewise the same way that the amplitude is, then hath the Compasse no variation : but if the sunne hauing north amplitude, riseth notwithstanding more Northerly by your Compasse, then by the said amplitude it should doe, the degrees of true amplitude, deducted from the amplitude which the Compasse sheweth, leauing the variation of the Compasse to be Eastward of the North : but if the true amplitude be greater, then the Compasse sheweth, the one deducted from the other, leaueth the variation to the Westward of the north and if the amplitude be southerly, and the Compasse shew the Sun to rise northerly, both the differences added together giues the variation easterly : or if the Amplitude be Northerly, and the Compasse shewes it to be Southerly, then both the differences added together, giues the variation Westerly. All this is to be understood, when you obserue by the Amplitude Ortine, viz. at the Sunnes rising : for if you obserue the setting thereof, then by adding or deducting the differences betwixt the true amplitude knowne, and the Amplitude giuen by the Compasse, the totall or remaine shewes the Compasse to vary so much to the contrary side : an example will make all this plaine vnto you, which let it be thus proposed. Suppose that being at Sea, you find by the Table of lines hereafter set downe (or by some other meanes) the Sunnes Amplitude at that time to be 20. degrees to the Northward, and setting the Sunne at his rising by the Compasse (as is before shewed) you find that the Sunne riseth 35. deg. to the Northward of the East, which is somewhat to the Northward of the northeast and by E. point, therefore subtracting 20. deg. the Sunnes true Amplitude, from 35. deg. the Amplitude which the Compasse sheweth the remainder being 15. deg. sheweth the Compasse to be so much varied from the North to the Eastward, which is 1. whole point, and about 1. third, otherwise the Sunne hauing the same Amplitude Northerly, (as is afore

The Sea-mans Kalender,

said) and setting him at his going downe by the Compasse, the sayd Compasse sheweth him to set onely 5. deg. to the Northward of the West, which deduct d from 20. deg. the true Amplitude leaueth 15. deg. for the variation of the Compasse to the Eastward, as before.

As for Example.

Suppose that the Sunne hauing 23. deg. of South Amplitude, and the Compasse sheweth his Amplitude or rising to be 11. degrees Northwardly adde 23. degrees the true Amplitude with 11. degrees of contrary Amplitude, which the Compasse sheweth, and the product 34. degrees, being 3. whole points and somewhat more, sheweth that the compasse is so much varied from the true North to the Eastward.

Againe, the Sunne hauing the same Amplitude Southerly, you observe at his setting, and finde by your Compasse that hee setteth 11. deg. Northwardly, adding the 2. Amplitudes as aforesaid, 23. and 11. the product 34. sheweth the variation so much to the Westward, being that in the obseruation at his rising, the East and by North points of the Compasse standeth where the East South west should be: and at his setting in the other obseruation, the West and by South points of the Compasse, pointeth to the Sunne, in which place should be the West South west points.

The few words will suffice, being (that albeit to the ignorant they seem somewhat darke) yet in the practise therof, they shall finde it I doubt not, but very plaine and easie for their vnderstanding, otherwise there are sundry sorts of Instruments to finde the variation by. but others hauing already writtten thereof, I haue thought good also to shew my opinion of this plaine and easie way, knowing that the Harriner hauing made experience of many wayes, will onely be that which he findeth best, both for his ease, profit, and truth thereof And note, that whatsoeuer is here spoken concerning the finding of the variation by the Amplitude, the very like may be also obserued by the Azimuth which by the Sunne or starres, being to be seene, may at anytime be knowne.

How

The Sea-mans Kalender.

glasse a running iust at 12. a clock, when the Sunne is vpon the Meridian: being run out bee sure to turne the said glasse instantly as it is out, not loosing any time in the turning of it, and so hauing very warily kept the said glasse till you thinke good to make an obseruation, at which time it is requisite to haue in readinesse a halfe houre glasse, and a minute glasse, that if the 24. houre glasse be out before the Sunne come to the Meridian, then so soone as it is out, to turne the halfe houre glasse or mi. glasse as you see occasion thereby to know presently how much the 24. houre glasse is out before the Sunne comes to the Meridian; for if the Sunne is vpon the Meridian iust when the 24. houre glasse is out, then you may assure your selfe that you haue sayled North or S. and are still vnder the same Meridian that you were at the first: but if the 24. houre glasse be out before the Sunne come to the Meridian, for every 4. min. that the glasse is out before noone, your difference of Longit. is 1. deg. to the Westward, and for every houre 15. deg. And contrary, if the Sun come to the Meridian before the glasse is out, then according to the same proportion of time, is your difference of Long. to the eastward, which difference of Longit. if you multiply by the number of miles answerable to a deg. of Longit. in that Latit. where you then finde your selfe to be, the product gives the miles of distance, that you are eyther to be Eastward or Westward of the Meridian, that you departed from.

The like may also be effected by any of those fixed starres, whose true time of coming to the Meridian you know: For if the accompt of time precisely kept by your glasse, and the stars coming to the Meridian as you finde in your table of right ascension doe iustly agree, then are you still vnder one and the same Meridian, but if the time be past by your accompt, that the said Starre should be vpon the Meridian before the starre doth come to the Meridian, for every houre that the star comes to the Meridian after the sayd time past, your difference of Longit. is 15. deg. to the Westward, and for every houre that the starre comes to the Meridian before by your accompt, of time truely kept, it should be vpon the Meridian, your difference of Longitude is 15. deg. to the Eastward. Thus much shall suffice to be spoken concerning my opinion for finding
the

The Sea-mans Kalender.

the Longitude at Sea by obseruation, and now rests to speake somewhat of some necessary helpes, for the finding thereof by dead reckoning, as is before promised.

Of the variation of the Compasse.

Concerning the Variation of the Compasse, it hath bene very learnedly treated of by diuers of our owne Country-men, and in our vulgar tongue, and namely by Master Norman, and M. Burrowes, in their Booke called the New Attractive, and Variation of the Compasse: And since that, most excellently and ingeniously written of by that rare and learned Mathematician, of our time, M. Wright, in his booke of the Correction of Errors in Nauigation: as also in his Translation called the Hauens finding Art: In which respect it is needlesse for me here to write any thing thereof: onely let it suffice to speake a little thereof, and being necessary to the knowledge of the foregoing matter, for them that would willingly note how much the Compasse doth vary in several places of their sailing: I thinke it best to haue the Needles of their compasses touched vpon a good Stone, and so placed directly vnder the North point of the Fly, without allowing any variation at all, the outer edge of the said Fly to be graduated each quarter into 90. deg. for the ready reckoning of the deg. that the Compasse doth vary from the true North or South either toward the East or West: ouer which Fly, it is necessary to haue a round Circle of Brasse, with 2. sights vpon the same the one directly against the other at opposite points to be raised perpendicularly where occasion shall serue: which circle, with the sights thereon, as I haue said, being placed vpon the glasse ouer the Fly, within the box where the Compasse is: when you would obserue the Variation of the Compasse iust either at the Sunne arising or setting, turne the sights in the Brasse circle towards the sunne, and looking through the same, marke precisely how many degrees the Sunne riseth or setteth from the East or West point of the Fly or Compasse: For if the Sun be in the Equinoctiall hauing then no amplitude so much as is the difference of the Sunnes rising or setting from the E. or W. points, shewed by the Compasse, is the variation of

The Sea-mans Kalender.

Example.

London and Middleborough haue both in a manner one Latit. viz. about 52. degr. and I find in this Table, that in the Paralell of 52. degrees 37. miles make a degr. of Longitude, the Longitude of London is 25. degrees 50. minutes, which subtracted one from another, leaues 3. degrees 50. minutes for the difference of Longitude. Then multiplying 3. degrees by 37. miles, the Product is 111. miles: Then for 50. minut. I say by the rule of 3. if 60. minut. giues 37. miles, what giues 50. minutes: Facit nere 31. which added to 111. makes 142. miles, or 47. leagues and a mile for the distance betwixt London and Middleborough.

But if the two places differ both in Longitude and Latitude, then is the working more difficult then either of the former: For first you must take the difference of the two places in Longit. and then their difference also in Latit. and multiplying the degr. of their difference in Latit. by 60. set the Product thereof by it selfe, for the first number: then multiply the difference of Longit. by the number of miles answerable to each Latit. severally, and adde both the Products together: the halfe whereof set downe for your second number, and multiplying each of the said two numbers into it selfe squarely, adde both the products together, and extracting the square roote thereof, the said square roote, is the distance betwixt the two places desired.

As for Example.

To goe directly in a right Line from Callice in France, to Constantinople in Grecia: I find by the Tables following, that the Longit. of Callice is 29. deg. 10. min. and the Latit. thereof 50. deg. 40. minut. Also the Longitude of Constantinople is 61. deg. 20. min. and the Latit. 44. deg. 40. min. then subtracting the

Min. to a Deg.	Deg. of Latit.	Min. to a Deg.	Deg. of Latit.
30	60	30	60
29	61	29	61
28	62	28	62
27	63	27	63
26	64	26	64
25	65	25	65
24	66	24	66
23	67	23	67
22	68	22	68
21	69	21	69
20	70	20	70
19	71	19	71
18	72	18	72
17	73	17	73
16	74	16	74
15	75	15	75
14	76	14	76
13	77	13	77
12	78	12	78
11	79	11	79
10	80	10	80
9	81	9	81
8	82	8	82
7	83	7	83
6	84	6	84
5	85	5	85
4	86	4	86
3	87	3	87
2	88	2	88
1	89	1	89

The Sea-mans Kalender.

the lesser Longitude, from the greater, the difference of Longitude is 32. deg. 10. min. Also I take the one Latitude from the other, and there rests 6. deg. for the difference thereof, which 6. degrees multiplied by 60. miles, produceth 360. miles for the distance betwixt the Paralell of Callice, and the Paralell of Constantinople. Now for the distance betwixt Callice, and the Meridian of Constantinople, I multiply 32. degrees 10. minutes, the difference of Longitude by 8. the miles answerable to a degree in the Paralell of Callice, and the Product is 1222. miles: When multiply 32. degrees 10. minutes, the aforesayd difference of Longitude by 42. miles answering to a degree in the Paralell of Constantinople, which Product being 1351. miles, is the distance betwixt Constantinople, and the Meridian of Callice: Those two distances added together make 2573. the halfe whereof, being 1286. is the meane distance betwixt the Meridians of the said two places: So haue you two numbers, viz. 360. miles, the distance that the Paralell of Constantinople is to the Southwards of Callice, and 1286. miles the distance that Constantinople is to the Eastward of the Paralell of Callice: Therefore if you multiply 360. into it selfe, the Product is 129600. And likewise multiplying 1286. into it selfe, the product is 1653796. which both added together,

1 2 2 2
1 3 5 1
2 5 7 3
1 2 8 6

1653796
129600
———
1783396

1783396 | 1

The manner how to extract the square and Cube roote of any number is more plainly taught, toward the end of the Booke,

make 1783396. the square root of which number is the distance desired: Which to helpe those that are not perfect in extraction of rootes, I haue here set downe the working thereof as followeth. — First, I set downe the proposed number with a Quotient, and vnder the last figure, I put a prick: and so likewise vnder each other figure toward the left hand, leaving betwixt each prick one figure vnprickt: So haue I vnder this number, 4. prickes, signifying that the roote must consist of foure figures, and to finde them out.

How many Leagues sayling vpon any Point of the Compasse, will raise or lay a Degree of Latitude, and what difference of Lon- gitude you make therewith.

This is so common in euery Booke, that I neede not to write thereof, but only being that it is a nece^{ssary} helpe to that which hath bene before spoken of, it is not amisse to set it here downe being as followeth.

First, sayling South and North you keepe still one Meridian: and in sayling 20. English leagues you eyther raise or depresse the Pole 1. deg. But if you sayle vpon the first point or Kombe from North or South eyther Eastward or Westward you must sayle 20. leagues, and one third part to raise or lay a degree of Latitude: and so hauing changed your Paralell one degree, you are al^{so} departed from your first Meridian 4. leagues that way which your course was.

Upon the second point or Kombe from North or South 21. leagues and one third, raise or lay a degree of Latitude, and your distance from the Meridian is 8. leagues and one third.

Sayling vpon the third point 24. leagues, to raise or lay a degree, and distance from the first Meridian, is 13. leagues and one third.

Upon the fourth point 28. leagues and one third, raise or lay a deg. of Latitude, and distance from the Meridian, is 20. leagues.

Upon the fifth point 36. leagues raise or lay a degree of Latitude, and distance from the Meridian, is 30. leagues.

Sayling vpon the first point or Kombe 52. leagues and one third, raise or lay a degree, and hauing altered your Latitude one degree vpon that point, you are departed from the first Meridian 48. leagues, and one third.

If you sayle vpon the seventh point, being the next from the East or West you must sayle 102. leagues and 2. thirds, before you raise or lay the Pole one degree, and then are you 100. leagues from your first Meridian but if you sayle East or West, then are you still in a Paralell, and neither raise nor lay the Pole at all.

The Sea-mans Kalender,

To finde the distance betweene any two places, knowing the Longitude and Latitude of them.

If the 2. places differ onely in Longitude, then are they both vnder 1. and the same Meridian: and to know the distance betwixt them in miles or leagues, multiply the number of the Deg. of difference, by 60. miles, or 20. leagues, the Product of which multiplication giues the true distance betweene them in miles or leagues, according as you worke them, being that 60. miles or 20. leagues makes 1. Deg. of a great Circle: but if the one place haue North latitude, and the other South, then adde both their Latitudes together, and worke as aforesaid: and if both the places are vnder the Equinotiall, then haue they no Latitude: And there likewise 60. miles, or 20. leagues make 1. Deg. and the working like the former, if the difference be vnder 180. Degres. For if the difference be more then 180. subtract the said difference from 360. and multiply the remainder by 60. or 20. as before.

These are so plaine and easie that they neede no Examples: but if they differ both in Longitude, or in Latitude, and Longitude onely in any Paralell beside the Equinotiall, the working is somewhat more difficult, by reason that the further the Paralels are distant from the Equinotiall towards eyther of the Poles, the shorter they are: and the shorter the Paralels are, the fewer min. or miles make a Deg. so that whereas in the Equinotiall 60. min. or miles make a Deg. in that paralell where the Pole is raised 52. Deg. 37. mi. makes 1. Deg. viz. 1. Deg. in the Latit. of 52. running in E. or W. answers to 37. miles: for which purpose, as also for diuers necessary uses I haue here added a Table, shewing the miles of distance and minutes of Time, answerable to a Deg. in euery severall Deg. of Latitude from the Equinotiall towards eyther of the Poles: And when you know the miles answerable to a Deg. in the Paralell desired, if the difference of the two places be onely in Longitude, multiply the difference of their Longitude by the number of miles answerable to a Deg.: and the Product sheweth the distance in English or Italian miles betwixt the said two places.

Example

The Sea-mans Kalender.

I seeke what is the greatest square number over the first p^{ri}cke, which is 1. therefore I put 1. in the quotient for the first figure of the roote, and cancell the figure over the first p^{ri}ck: then to find the second figure of the roote, I multiply the quotient by 20. which being 1. both neither multiply nor divide: therefore I seeke how often 20. is contained in 78. the number of the second p^{ri}cke, which you must take no other then that the square of the said number being added, therewith may be likewise taken therefro, so I see 3. times 20. being 60. & the square of 3. which is 9. added thereto, I put 3. in the quotient, taking 69. from 78. the number over the 2. p^{ri}cke leaues 933. to the 3. p^{ri}cke: then for the 3. figure of the roote, I multiply 13. the quotient by 20. the product is 260. which I seeke how often it may be taken out of 933. and I find that 3. times 260. is 780. wherunto the square of 3. being added makes 789. therefore I put 3. in the quotient, and subtracting 789 from 933. rests 14496. for the 4. p^{ri}ck: then for the last figure of the roote, I multiply 133. the whole quotient already found by 20. and the product is 2660. which may be taken 5. times in 14469. for 5. times 2960. is 13300. vnto which 25. & square of 5. added makes 13325. therefore I put 5. in the quotient, for the fourth and last figure of the roote: and making my subtraction as afoze, the worke will stand as you see, by which you may know the square roote of the proposed number to be 1335. and very nere. So I conclude the true distance betwene Callice and Constantinople, to be 1335. miles, and nere halfe a mile. The manner how to extract the roote of any number, is set downe more at large after the Tables of Sines.

$$\begin{array}{r}
 1783396 \quad | \quad 1 \\
 \underline{20} \\
 1 \\
 \underline{20} \\
 3 \\
 \underline{60} \\
 9 \\
 \underline{69} \\
 1783396 \quad | \quad 13 \\
 \underline{260} \\
 69 \quad 13 \\
 \underline{20} \\
 260 \\
 \underline{3} \\
 780 \\
 9 \\
 \underline{789} \\
 1783396 \quad | \quad 133 \\
 \underline{133} \\
 69 \quad 20 \\
 \underline{789} \quad 2660 \\
 5 \\
 \underline{13300} \\
 111 \quad 25 \\
 94471 \quad | \quad 13325 \\
 1783396 \quad | \quad 1335 \\
 \underline{169} \\
 789 \\
 13325
 \end{array}$$

The

The Sea-mans Kalender.

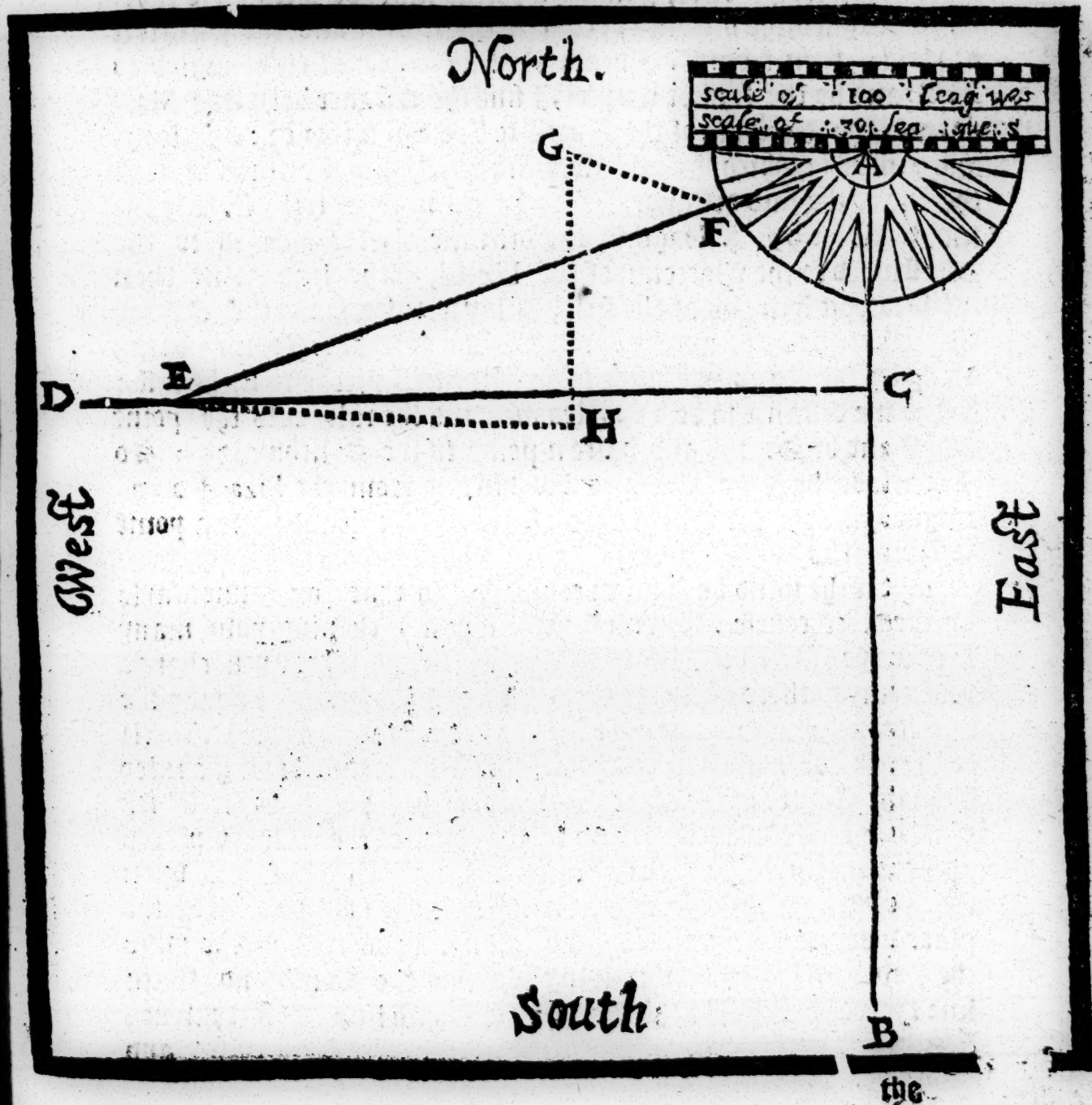
The ingenious Mariners may sayle by knowing the true Longitude & Latit. of places, to any place assigned, as well by a blanke of paper and past-board, as by the Sea Card, by the helpe of a Protractor in this manner: First, vpon the board or paper lined with Meridians and Paralels, or to them that can make a right Angle vpon any picke or point, a sheet of cleane paper is sufficient to keepe a Trauerse vpon: To know your course from the place where you are, to any other place assigned: as I say vpon your board or paper, make a picke for the place where you then are and from the said picke drawe a right line to represent the Meridian of the same place: then placing the Center of the Protractor vpon the said picke, lay the 90° or $S.$ point of the Fly or Protractor as the place beareth, vpon the line ready drawne. Then by the last Chapter, learne the distance of miles betwixt the place where you are, and the paralell of that place you are bound to: or more briefly, what portion of the meridian is comprized betwene the Latit. of the two places: that distance by the scale of the protractor, apply to the Meridian by you drawne, and where the distance ends, draw another line square, or at right angles to the other, either East or West, as the situation of the place assigned requireth: and by the former Chapter learne the distance betwixt the Meridian by you drawne, and the Meridian of the other place assigned: which knowne (by your Scale) apply that distance to your line of East or West, and where that number of distance ends, make another picke for the true situation of your place assigned: then laying a thid or ruler from the Center of the Protractor, being the place where you are, and extending it to the other picke last made, the edge of the ruler or line shewes vpon the protract the point of the Compass that the place assigned beares from the place where you are: and the Scale applyed to the said line or edge of the ruler, shewes the distance: also the distance may be knowne by extracting the square root in as is before shewed, an example of this, and for the vse of the Trauerse-board, and so an end.

A Ship being at the Lizard, in the Southwest parts of England, whose Longitude and Latitude I finde in the Table following to be 18° . degrees. 30 . minutes, and 50° . deg. 10 . minutes, is bound

The Seamans-Kalender.

bound for an Island in the Ocean sea called Maida, whose Longitude I finde in the same Table, to be 2. degrees, 40. minutes, and Latitude 46. deg. 40. min. the Difference of their Latitude is 3. deg. 30. min. which is 210. miles, or 70. leagues: Therefore from

Type of a Trauerseboard and a Protractor.



The Sea-mans Kalender.

the prick or point A. I draw the lines A. B. in the Trauerse board here adioyning, and vpon the point A. I place the Center of the Protractor, being one halfe of the Mariners Compasse, the middle point whereof representing the N. or S. (as occasion serues) I lay vpon the line A. B. and applying 70. leagues (whereof the scale on the edge of the Protractor containes 100.) from A. towards B. where the said 70. ends, I make a prick marked with C. so is A. C. 70. leagues, the distance betwene the Lizard and the Paralell of Maida, then from C. I draw the line C. D. at right angles to A. B. and by the former chapter, I find the distance betwene Maida, and the Meridian of the Lizard, to be 629. miles or 209. leag. and 2. miles: which by scale aforesaid applyed to the line C. D. at the end of the said distance, I set a prick marked with E. so is the line C. E. 209. $\frac{2}{3}$. leagues, the distance that Maida is to the Westward to the Meridian of the Lizard, or the line A. B. then the Protract lying as at the first, I lay a ruler from the Center thereof, to the last prick E. and with the former scale, measuring along by the edge of the ruler from A, the first prick to E. the last: I find the distance to be 222. leagues, and the ruler cuts the point West and by South, and halfe a point to the Southwards: So I conclude the Ile of Maida to be distant from the Lizard 222. leagues, and the direct course West and by South, and halfe a point Southwards.

But if the wind be scant or contrary, so that you cannot sayle by the direct course: then must you keepe a reckoning how many leagues you sayle vpon euery other point: and where you change your course, there place the Center of the Protract, keeping the Meridian or North and South line of the Protractor, Paralell to the Meridian drawne on the Trauerse board, and laying a ruler from the Center of the Protractor, along that point vpon which the Ship maketh her way, and to the edge of the ruler so placed apply so many leagues of the scale, as the Ship hath sayled vpon that point, and then where that number ends, set a prick for the place where the Ship then is, and againe, vpon that prick place the Center of the protractor, lying as befoze, the South and North line thereof paralell to the Meridian or South line first drawne, and

The Sea-mans Kalender.

and then laying a ruler to the center of the Protractor, being the place where the ship then is, and to the place assigned, it shewes vpon the Protractor, the point how they beare, and the scale applyed thereto shewes the distance, as in the former example: Having sayled from the Lizard in the right course 50. leagues, being then in the point F. the winde cometh to another point, so that she maketh her way West and by North 40. leagues: at the end of which course is the Letter G. from thence she runneth S. 75. leagues: at the end of which course is H. then from H. to know the distance, and what course must be kept to the prefired place of Maida marked with E. I place the Center of the Protractor vpon H. and the edge thereof, which is then North and South Paralell or equidistant to the first line A. B. which so placed, I lay a ruler from the center thereof to E. and I finde the course to be West, and halfe a point to the North 125. leagues.

Note, that it is necessary to haue vpon your Protractor two seuerall scales, a greater and a lesser, for the greater the scale is you keepe your reckoning by, the truer shall your accompt be.

Necessary Questions of Nauigation, with their Answers.

Question. 1.

If I saile from the Paralell of 50. degrees, 70. leagues vpon a Southwest course, I demand how much I lay or depresse the Pole, and how many degrees and Leagues, I depart from the Meridian?

Ans. Pole depressed 2. deg. 28. min. difference of Longitude 3. deg. 25. min. leagues from the Meridian 49. and $\frac{1}{2}$.

Q. 2. If I saile from the paralell of 40. degrees vpon a West North-west course, vntill I raise the Pole 3. deg. 30. min. I demand how many leagues I haue sailed: and how many degrees and leagues I haue departed from the Meridian?

A. Leagues sailed 183. difference, Longitude 12. deg. 11. min. leagues from the Meridian 169.

The Sea-mans Kalender.

Q. 3. From the Paralell of 47. deg. if in sayling 108. leagues betwene West and North, I raise the pole 3. deg. I demand vpon what Kombe I haue sailed: as also how many deg. and leagues I am from the Meridian, from whence I began that course?

A. A Kombe Northwest and by west, Difference Longitude 6. degrees 36. minutes leagues from the Meridian 90.

Q. 4. If from the Paralell of 50. deg. I saile so long betwene North and East, till I raise the Pole 6. deg. and departe from the Meridian 4. degrees, I demand vpon what point of the compasse I haue sailed, and how many leagues I haue runne?

A. The course is nere North Northeast, leagues runne 126.

Q. 5. If from the Paralell of 50. degrees I saile Northwest, untill I am 4. deg. from the Meridian where I began my course, I demand how many leagues I haue sailed, and how much the Pole is raised?

A. Leagues sailed 70. and two thirds, Pole raised two degrees and a halfe.

Q. 6. Two Ships departing from one place of the Paralell of 50. degrees the one in sayling 145. leagues towards the West, hath raised the Pole 4. deg. and the other hath raised the Pole 7. degrees and is 95. leagues West from the Meridian of the place from whence he began his course: I demand by what course the said ships haue sailed, how many leagues the two ships haue sailed, how farre they be a sunder, and by what course they may meete?

A. The first ship hath sailed Northwest and by west: The second hath sayled Northwest by North 173. leagues, they are a sunder 63. leagues, and the course betwene them is North Northeast, and South Southwest.

Q. 7. Two Ships departing from one place in the Paralell of 60. degrees, the one in sayling 145. leagues, towards the West, hath raised the Pole 4. degrees, and the other hath raised the Pole 7. degrees and is 93. leagues West from the Meridian of the place from whence he began that course: I demand, by what course the said Ships haue sailed the way of the two ships, how farre they be a sunder, and by what course they may meete?

A. The first ship hath sailed Northwest and by West, the second

The Sea-mans Kalender

second hath sayled Northwest and by North 168. leagues. They are
a sunder 64. leagues 3. deg. Easterly, course betwene them is
North Northeast.

Q. 8. Two Ships sayling from one place in the Paralell of 60.
deg. the one sayling 180. leagues Eastwards, hath raised the Pole
5. deg. I demaund vpon what course, and how many leagues the o-
ther Ship shall saile, to bring himselfe 50. leagues North by West
from the first Ship, and what they are both departed from their
first Meridian?

A. The first Ship hath sailed Northeast and by East, and is depar-
ted from the meridian 146. leagues. The second Ship must saile
Northeast 3. deg. Northerly, leagues 220. and is departed from the
Meridian where he began his course 169. leagues.

Q. 9. If I saile from the Paralell of 50. deg. 100. leagues North,
I demaund wh, at Latitude I am in?

A. In the Latitude of 55. degrees.

Q. 10. If I saile from the Paralell of 50. deg. South, till I lay
the Pole 5. deg. I demand, how many leagues I haue sayled?

A. 100. Leagues.

Q. 11. If from Latitude 22. deg. I saile in the Paralell of 60.
deg. 100. leagues East, I demaund, what longitude I am in?

A. In Longitude 32 degrees.

Q. 12. If from Longitude 22. deg. I saile in the Paralell of 50.
deg. to longitude 10. degrees. I dema,nd how many leagues I haue
sayled?

A. Leagues 154. and a quarter.

Q. 13. If I saile from Longitude 20. deg. and Latitude 40. to
Longitude 350. deg. 27. min. and Latitude 30. deg. I demand the
rombe and distance?

A. Course West Southwest, distance 520. leagues.

Q. 14. From Longit. 20. deg. and Latit. 45. deg. Northeast 20.
leagues, what Longit. and Latitudes hath the second place?

A Twenty three deg. Longitude 45. deg. 42. min. Latitude.

Q. 15. From Longitude 23. deg. and Latitude 45. deg. 42. min.
East and by North 30. leagues, what Longitude and Latitude
hath the second place?

The Sea-mans Kalender.

A. 25. deg. 9. min. Longitude, 46. degrees 5. min. Latitude.

Q. 16. From Longitude 25 deg. 9. min. and Latitude 45. deg. 59. min. East Southeast 25. leagues. What Longitude and Latitude hath the second place?

A. 26. deg. 46. min. Longitude, 45. deg. 31. min. Latitude.

Q. 17. From Longitude 26. deg. 53. min. and Latitude 45. deg. 31. min. North 40. leagues. What Longitude and Latitude hath the second place?

A. Longitude 26. deg. 53. min. Latitude 47. deg. 31. min.

Q. 18. From Longitude 26. deg. 53. min. and Latitude 47. deg. 31. min. 50. leagues West Northwest. What Longitude and Latitude hath the second place?

A. Longitude 23. deg. 57. min. Latitude 48. deg. 28. min.

Q. 19. From Longitude 23. deg. 57. min. and Latitude 48. deg. 28. min. East Northeast 60. leagues. What Longitude and Latitude hath the second place?

A. Longitude 28. deg. 27. minutes, Latitude 49. degrees 26. minutes.

Here followeth a briefe Tables of Sines for Arithmetical
Calculation, the totall sine whereof is 10000. with certaine
necessary Propositions to be wrought thereby, by which
few things proposed, and Example thereto annex-
ed, any one that hath either an ingenious spirit,
or a willing minde to the practise of the Ma-
thematicall Sciences, may attaine to much
knowledge therein.

A briefe declaration of the same.

Vhat the Table of Sines is, hath bene very Learnedly
explained by others, and therefore needesse is it for me
to discourse thereof; onely take the few instructions for the helpe
of those, which as yet haue no knowledge therein. First, know,
that

The Sea-mans Kalender.

that sayling, which is the principall thing here aymed at, is performed by a true and perfect knowledge of the Spheare, by the preiection wherof, all calculations, Tables calculated, and Instruments for obseruation are inuented, protracted, framed and made.

What the Spheare is, I need not to discusse, the chiefe or great Circles therof consisting of 360. deg. and one quarter thereof being 90. deg: which quarter being taken from the whole circumference, consisteth of these thre particulars, viz. An arch or part of a Circle being inded 90. deg. or a quarter of the whole Circle: right Angle, & two equall sides therto, of which the one is the base or ground lyne, the other a perpendicular let fall thereon at right Angles, the utmost ends or extentions, of which two lines are the limits of the aforesaid arch, or quarter of a Circle: the which thre parts so fitted together in there due order, sheweth the perfect platfome of one quarter of the whole Circle, commonly called a Quadrant: the base or ground lyne wherof being deuided into 10000. equall parts, is Sinus totus or the whole line: and the whole arch or quarter of a Circle into 90. degrees is the whole arch belonging to the said whole line.

Within which Quadrant, any number of deg. or min. counted from the beginning or first perpendicular may be called an arch, or part of a Circle: and another perpendicular let fall therefrom to the aforesaid base or ground line, the number of equall parts that y said perpendicular falleth vpon, is the right line to the arch giuen: and the complement of the arch giuen, is the remainer thereof it being taken from 90. deg. or the whole quadrant. To find out the right line of any giuen Arch, looke in the head of the Table following for the deg. thereof, and if there be any minutes therewith, looke for the minutes at the left side of the Table, and carrying your eye downeward from the degree, till you come right against the min. the number which you find in the common Angle to them both, is the right line of your giuen arch desired: as if you desire the line of 35. deg. 20. min. looke in the head of the Table for 35. and vpon the left side thereof for 20. and in the common square or angle right against them both, you shall finde 5783. which is the line of 35. deg. 20. min. and if you subtract 35. deg. 20. min. from 90. deg. the re-

The Sea-mans Kalender.

mainer 54. deg. 40. min: is $\frac{1}{2}$ complement thereof, whose right line (found as befoze is taught) is 8158. what the versed line is, and how found out, is afterward shewed. I doubt not but that these few wordes will suffice for $\frac{1}{2}$ explaining of the Table following, whose large and ample vles for Nauigation and other the Mathematical practises, these following examplary propositions, will in some reasonable sort make manifest: by which few here proposed and answered, the ingenious may gather the manifold vles thereof, being that indeed the benefit to be reaped thereby is great, and the propositions to be wrought thereby infinite. Who so desires more perfection in this kinde of Nauigation, and generally in all Mathematicall practises, let them spend some time in the study of Pitiscus of the Doctrine of Triangles, not long since translated and published in our English tongue by Mr. Raph Handson.

Certaine Propositions to be wrought by the Table of Sines.

The Sunnes true place being knowne, to finde
his Declination.

Prop. 1.

As the whole Sine is to the sine of the greatest Declination, so is the sine of the Sunnes distance from the nearest Equinoctiall point, to the sine of the declination for the day proposed.

Example.

I would know the Declination of the Sun the 1. of May 1630. at what time the true place of the Sun being in 20. d. g. 36. min of Taurus, is 50. d. 36. min. from the beginning of Aries or the vernal Equinoctiall point, therefore I must multiply the sine of 50. degr. 36. min. the Suns distance from the Equinoctiall point by the sine of 23. degr. 31. min. the greatest declination, and that product must be deuided by the whole sine, whose seuerall sines being found out in the Table following, and set in order, the worke will stand thus

— If 90. giue 23.31. what 50.36.

10000: 3990. 7727.

Facit, 3083. whose nearest arch 17.57 minutes, is the true Declination of the Sunne, the day and pæces aforesaid.

The

The Sea-mans Kalender.

The Declination of the Sunne giuen, to finde his place in the Zodiacke. Prop. 2.

As the line of the greatest Declination is to the whole line, so is the line of the Declination for the day proposed to the Sunnes place or distance from the nearest Equinotiall point.

Example.

The first of May, 1626. I finde that the Declination of the Sun is 17. degrees 57. minutes South, therefore I say :

If 23.31. giue 90. what 17.57.

3990. 10000. 3083.

Facit, nearest to 7727. whose arch 50. deg. 36. min. is the Suns distance from the vernal Equinotiall point of Aries, from which taking 30. degr. the whole line of Aries, the remainder 20. deg. 36. min. shewes the Sunne to be so much entred into Taurus, which is the next line.

The Latitude and Declination of the Sunne giuen, to finde the Amplitude.

Prop. 3.

As the line of the Complement of the Latitude is in proportion to the whole line, so is the line of the Sunnes Declination to the Amplitude.

Example.

The 10. of Aprill 1628. I desire the Amplitude of the Sun. viz. how much the Sunne doth rise and set from the true East and West point of the Horizon, towards the South or North in the Latitude of 51. deg. 40. min. to know which, the worke is thus.

If 38. deg. 20. min. the complement of the Latitude, giue 90. degrees the arch of the whole line, what giues 11. degr. 48. min. the Declination of the Sunne.

38 deg. 20. min. 90. 11.48. minutes.

6102. 10000. 2045.

Facit, 3297. nearest whose arch sought out in the Table of lines, is 19. degr. 15. min for the Amplitude in the day, yere and place proposed: the same deuided by 11. and 1. quarter, the number of degrees that belongs to a point of the Compasse, sheweth one

The Sea-mans Kalender.

point and 8. degrees which the Sunne riseth and sets to the Northward of the East and West, being that the Declination is North, for if the Declination were S. then were the Amplitude southerly.

The Declination and Amplitude of the Sunne
giuen, to finde the height of the Pole.

Prop. 4.

As the Sine of the Amplitude is in proportion to the sine of the Declination, so is the whole sine to the sine of the complement of the Latitude.

Example.

The Declination 11. degr. 43. min. and the Amplitude 19. deg. 7. minutes, I demand the height of the Pole: Say,

If 19. 7. giue 11. 43. what 90.

3275.

2031.

10000.

Facit, 6202. nearest whose arch in the Table of sines being 38. degrees 20. minutes is the height of the Equinoctiall, or the complement to the Latitude: that subtracted from 90. degrees, leaues 51. degrees 40. minutes, for the height of the Pole or Latitude of the place desired.

The true place and Declination of the Sunne giuen, to
finde the right ascension. Prop. 5.

As the Sine of the Complement of the Declination is to the totall sine, so is the sine of the complement of the Sunnes distance from the beginning of Aries, to the Complement of the right ascension.

Example.

I desire the right ascension of the Sun the 20. of Aprill. 1629. being then in 1 c. de. 14. min. of Taurus, at which time his Declination is 14. deg. 56. min. and the complement thereof 75. deg. 4. min. and the distance from the beginning of Aries, 40. deg. 14. min. whose complement is 49. deg. 49. minutes: I say then,

If 75. 4. giue 90. what 49. 49. minutes?

9663.

10000.

7634.

Facit,

The Sea-mans Kalender.

Facit, 7900. whose arch in the Tables of lines is 52. degrees 11. min. the complement whereof 37. deg. 49 min. is the Sunnes right ascension: the same conuerted into houres by allowing 15. deg. to an houre, giues two houres and 31. minutes.

This is to be vnderstood, when the Sunne is betwixt the beginning of Aries, and the Tropike of Cancer, for if the Sunne be in the Tropike of Cancer, then is the right ascension 90. deg. 02 6. houres: and if the Sunne be betwixt the Tropike of Cancer, and the Equinodiall point of Libra, subtract the distance that the Sun is from the beginning of Aries, out of 180. degrees, and with the remainder worke as before for the right ascension, which ascension so found, take from 180. and the remainder is the right ascension desired, But if the Sunne be betwixt the Equinodiall of Libra, and the Tropike of Capricorne, subtract the said distance from the beginning of Aries, out of 270. degrees; and if betwixt the Tropike of Capricorne, & the beginning of Aries, take the said distance out of 360. degrees, and then worke as before. One Example or two will make all this plaine vnto you.

The last of Iune 1630. the true place of the Sunne 17. degree, 51. min. of Cancer, is 107. deg. 51. minutes from the beginning of Aries, which taken from 180. leaues 72. deg. 9. minutes, whose complement is 17. deg. 51. minutes, the Sunnes Declination being then 22. deg. 20. min the complement thereof 67. deg. 40. minutes. Say then,

If 67.40.	giue	90.	what	17.51. minutes?
9250.		10000.		3065.

Facit, 3314. whose arch is 19. deg. 21. min. & complement whereof 70. deg. 39. min. taken from 180. leaues 109. deg. 21. min. for the right ascension desired, which conuerted into houres, makes 7. houres 16. minutes. Againe, I desire the right ascension of 20. deg. 40. min. of Capricorne, whose distance in continuall proceeding from the beginning of Aries, being 290. deg. 40. min. taken from 360. leaues 69. deg. 20. minutes, with the complement whereof 20. deg. 40. min. and the complement of the Declination of the Sunne vpon the same point of the Sunnes place 68. deg. 6. min. I worke as followeth.

The Sea-mans Kalender.

If 68.6. giue 90. what 20.40.

9278. 10000. 3529.

Facit, 3803. whose arch is 22. deg. 21. min. the complement whereof 67. deg. 39. min. taken from 360. leaues 292. deg. 21. min. for the right ascension desired, the same conuerted into houres, is 19 houres 29. minutes.

The Latitude and Declination of the Sunne knowne, to finde the difference ascensionall.

Prop. 6.

As the sine of the Complement of the Latitude, is to the sine of the latitude, so is the sine of the Declination to the quotient found: againe, as the sine of the complement of the Declination is to the whole sine, so is the said quotient found to the difference ascensionall.

Example.

I would know the difference ascensionall, when the Declination is 20. deg. 6. minutes, and the latitude 51. degrees 40. minutes? I say,

If 38.20. giue 51.40. what 20. 6.

6202. 7844. 3437.

Facit, 4346. for the quotient found: then againe, I say,

If 69.54. giue 90. what

9391. 10000. 4346.

Facit, 4627. whose arch in the Table of lines, 27. degrees 34. minutes is the difference ascensionall for the day proposed: the same reduced into houres and minutes, makes one houre and 50. minutes, which taken from 6. a clocke, the houre that the Sunne riseth, being in the Equinoctiall, leaueth 4. houres. 10. min. at what time the Sunne then riseth, and the said ascensionall difference added to 6. a clocke, makes 7. a clocke, 50. minutes, for the Sunne rising.

Again, the said ascensionall difference doubled and added to 12. houres, the time from 6. in the morning till 6. at night, makes 15. houres 40. minutes for the whole length of the day.

This is when the Sunne hath North Declination, for if the Declination

The Seamans-Kalender.

Declination be South, then the ascensionall difference added to 6. a clocke, giues the Sunnes rising, and taken from 6. leaues the setting, and being doubled and taken from 12. heures, leaues the length of the day, as aforesaid.

The Amplitude and difference ascensionall of the Sunne
or Starres giuen, to find the Declination.

Prop. 7.

As the sine of the time of the Sunnes rising, conuerted into degrees and minutes, is to the sine of the complement of the Amplitude, so is the whole sine to the sine of the complement of the Declination.

Example.

The difference ascensionall being 27.deg.34.min. shewes the Sunne to rise at 4. a clocke 10.min. which conuerted into degrees, makes 62.deg.30.min. and the Amplitude being found as before is thewed, in the third Proposition, is 33.deg.38.min. and the complement thereof 56.deg.22.min. Say then,

If 62.30.	giues	56.22.	what	90.
8870.		8326.		10000.

Facit, 9386. whose arch 69.deg.50.min. the complement thereof 20.deg.10.min. is the Declination desired.

The Latitude and Declination giuen, to finde
the Meridionall Altitude.

Prop. 8.

If the Sunne haue South Declination, adde the complement of the Latitude with the Declination, the product is the Meridionall Altitude.

Example.

If the Declination, be 23. deg. 30. min. South, and the Latitude 51. degrees 40. minutes, the complement thereof 38. degrees, 20. added with 23.30. minutes, make 61. degrees 50. minutes, for the Meridian Altitude: but if the Declination be 23. deg. 30. South, and the Latitude 51. degrees 40. minutes, subtract 23. degrees 30. minutes. the Declination from 38. degr. 20 minutes the

The Sea-mans Kalender.

the complement of the Latitude, and the remainer 14. deg. 50. min. is the altitude desired: and if the Sunne be in the Equinoctiall, hauing no Declination, then is the Meridian altitude equall to the complement of the Latitude.

The Latitude and Declination knowne, to find the height of the Sunne at any houre of the day.

Prop. 9.

First, you are to consider, whether the Sunne be in the Equinoctiall, or whether he hath North or South Declination, for if the Sunne be in the Equinoctiall, then as the whole sine is to the sine of the complement of the Latitude, so is the sine of the complement of the Sunnes distance from noone, allowing 15. deg. for every houre to the sine of the altitude desired.

Example.

At any yere or day, the Sunne then hauing no Declination, the Latitude 51. deg. 40. min. I desire the Sunns height at 9. a clocke before noone, or at 3. after noone, the complement of the Latitude is 38. deg. 20. minutes and the houres distance from noone, 45. degr. whose complement is also 45. deg. Say then,

If 90. giue 38.20. what 45.

10000. 6202.

7071.

Facit, 43 85. whose arch 26. deg. is the height of the Sun aboue the Horizon, the time and place proposed.

If the Sunne haue Declination, then is the working somewhat more tedious, except onely at 6. a clock, either before or afternoone: for which houre, as the whole sine is to the sine of the Latitude, so is the sine of the Declination, to the sine of the Altitude.

Example.

The 10. of Aprill 1624. the Latitude 51. deg. 40. min. and the Declination 11. deg. 48. min. Say,

If 90. giue 51.40. what 11.48.

10000.

7844.

2045.

Facit, 1604. whose arch 9. deg. 14. min. is the Altitude desired.

But for any other houre of the day, if it be lesse then 6. houres,

The Sea-mans Kalender.

or 90. degr. worke as folloves, multiply the sine of the houres distance from noone by the sine of the complement of the Latitude, the product deuide by the whole sine, and the arch of the quotient taken from 90. set apart for y number first found, which number so found, compare with the latitude, then multiply the whole sine, by the sine of the lesser, and deuide the Product thereof by the sine of the greater: and to the complement of the arch of the product adde the declination of the Sunne if the Declination be Northerly, or subtract if the Declination be Southerly, and if the Product or remainder be more then 90. degrees take it from 180. and the rest is the second found number, which two numbers so knowne.

As the whole sine is to the number first found, so is the second found number to the Altitude desired.

Example.

Any yere or day at 8. a clocke the Latitude 51. degr. 40. minut. the distance of the Sunne from noone 45. deg. and the Declination 11. degr. 43. minutes, I desire the Sunnes height: Say,

If 90. giue	38. 30. what	45.
10000.	6202.	7071.

Facit, 4385. whose arch 26. deg. taken from 90. leaues 64. deg. for the first found number, then comparing the latitude, and it together, the Latitude being the lesser, I multiply the whole sine by the sine thereof, and deuide by the sine of the first found, saying.

If 64.0, giue	51.40. what	90.
8988.	7844.	10000.

Facit, 8717. whose arch being 60. deg. 46. min. to the Complement thereof 29. deg. 14. min. I adde the Declination 11. degr. 43. minutes, and the totall 40. degr. 57. min. is the second found number, which two numbers so knowne, say againe.

If 93. giue	64. 0. what	40. 57.
10000.	8988.	6554.

Facit, 5890. whose arch 36. deg. 5. minutes, is the Altitude of the Sunne desired.

Againe, if the houre for which you desire the Sunnes height, be more then 6. houres or 90. degrees from the Meridian, you must

The Sea-mans Kalender.

must subtract the said distance from 180. and multiply the sine of the remainer, by the sine of the complement of the latitude, which product being divided by the whole sine, the complement of the quotients arch is the first found number, the sine whereof compare with the sine of the Latitude, multiplying the whole sine by the lesser: and deviding the product by the greater: from the arch of which quotient, if you take the complement of the Declination, you have the second found number, the sine whereof multiplied by the sine of the first found, and the product divided by the totall sine, the quotients arch is the Altitude desired.

Example.

At 5. in the morning, the Latitude 51. deg. 40. min. the houres distance from noone 7 02 105. deg. which deducted from 180. leaues 75. degr. for the houres distance, Say then.

If 90. give 38.60. what 75. 0.

10000. 6202. 9659.

Facit, 5990. whose arch being 36. deg. 48. min. the complement thereof 53. 12. is the first found number: Say then againe,

If 53. 12. giues 51.40. what 90.

8007. 7844. 10000.

Facit, 9796. from whose arch 78. deg. 25. min. taking 78. degr. 17. min. the complement of the Sunnes Declination, rests 8. min. for the second found number, which 2. number found, Say,

If 90. give 53. 12. what 08.

10000 8007. 023.

Facit, 18. whose arch 6. min. is the height of the Sunne above the Horizon at 5. in the morning, or 7. in the evening, the day and time aforesaid.

The Latitude giuen, to find how many minutes
or miles of the Equinoctiall, makes a degree
of Longitude in any paralell.

Prop. 10.

As the whole Sine is in proportion to 60. so is the sine of the complement of the Latitude, to the miles answerable to a degree in the Latitude desired.

The Sea-mans Kalender.

I desire to know how many miles in running East or West in the Latitude of 51. deg. 40. minutes, will alter one degree of Longitude: Say,

If 90.	give	60.	what	38. 20.
10000.				6204.

Facit. 37. for the number of miles answerable to a degree in the Latitude desired.

The Course and distance giuen, to finde out the difference of Latitude.

Prop. 11.

As the whole line is to the miles of way runne, so is the sine of the courses distance from East to West, the minutes of difference of Latitude.

Example.

Running West Southwest, which is 22. deg. 40. minutes, from the West 75. leagues or 225. miles, I demand the difference of Latitude: Say,

If 90.	give	225.	what	20.30.
10000.				3827.

Facit, 86. minutes or one deg. 26. min. for the difference of Latitude upon the said course and distance.

By Course and distance giuen, to finde the difference of Longitude.

Prop. 12.

As the whole line is to the miles of way that you haue run, so is the sine of the deg. that your course is distant from South or north to the miles that you are departed from your first Meridian,

Example.

Running Northwest and by North which is 33. deg. 45. min. from the North 60. leagues or 180. miles, I demand the difference of Longitude: Say,

If 90.	give	180.	what	33.45.
10000.				5556.

Facit, 100. miles which you are departed from the Meridian to

The Sea-mans Kalender.

to the Westward, which if you diuide by the number of miles answerable to a degree of Longitude, in the Latitude where you then finde your selfe to be, the quotient giues you the degr. and minut. of the difference of longitude.

By the distance and departure from the Meridian giuen, to find the course.

Prop. 13.

As the miles of distance that you haue runne, is in proportion to the whole Sine, so is the miles of your departure from the Meridian to the sine of your course from South to North.

Example.

Being departed from the first Meridian 75. miles in the running of 50. leagues, or a 150. miles, I demand vpon what point I haue sayled, it being betwixt South and West: Say,

If 150. giue 10000. what 75.

Facit, 5000. whose arch 30. deg. is the distance from South to, wards West that the course is, which is Southwest and by South southerly.

The Latitude, Declination and height of the Sunne giuen, to know the houre of the day.

Prop. 14.

Adde the complement of the Latitude, and the Declination together, and from the sine of the totall, subtract the sine of the Altitude obserued, the remainer is your number first found, which number first found, multiply by the whole sine, and deuide by the sine of the complement of the Latitude, the quotient whereof is the second found number, which second number so knowne, as the sine of the complement of the Declination is to the totall sine, so is the said second found number to the quotient, which quotient taken from the whole sine, the complement of the arch to the remainer, is the Sunnes distance from noone in degrees and minutes.

Example.

The 15. of May 1625. the Declination 21. deg. 4. minutes, and the

The Seamans-Kalender.

the complement of the Latitude 38. deg. 20. min. added together, is 59. deg. 24. min. the line thereof 8607. the height of the Sunne observed 48. deg. 30. min. the line thereof 7090. the which taken from the former number, leaues 1117. for the first found number: then I say,

If 68.20.	giue	90.	what
6201.		10000	1117

Facit, 1801. for the second found number. Again say,

If 68.56.	giue	90.	what
9332.		10000.	1801

Facit, 1929. which taken from 10000. leaues 8071. whose arch 53. deg. 49. min. subtrated from 90. leaues 36. deg. 11. min. for the Sunnes distance from the Meridian: that conuerted into houres, is 2. houres 24. min. from noone, when the Sunne is so high as aforesaid.

To finde the Sinus versus of any giuen Arch.

Prop. 15.

If the arch giuen, be lesse then 90. subtract it from 90. & the line of the remainer taken from the totall line, leaues the Sinus versus, but if the giuen arch be greater then 90. deg. subtract 90. deg. there from, and seeke the line of the remainer, which is alwaies the complement of the giuen arch: which Sinus adde to the whole line, and the totall thereof, is the Sinus versus of the giuen arch desired.

Example.

To know the Sinus versus of 47. deg. 12. min. the complement thereof, is 42. degrees, 48. minutes. whose line 6794. taken from 10000. the whole line resteth 3206. the reuerfed line of 47. deg. 12 minutes.

Likewise, to know the reuerfed line of 437. deg. 25. minutes, which is more then 90. deg. taking 90. therefrom; there resteth 47. degrees 25 minutes, the Sinus whereof 7363. added to the whole line, maketh 17363. for the reuerfed line of 137. degrees 25. minutes.

A table of Sines.

The Degrees of the Quadrant.

M.	0	1	2	3	4	5	6	7	8	9
1	3	177	351	526	700	874	1848	1222	1395	1567
2	6	180	353	529	703	877	1851	1224	1398	1570
3	9	183	355	532	706	871	1854	1227	1400	1573
4	12	86	61	39	09	83	57	30	03	76
5	14	88	62	38	12	86	60	33	06	79
6	17	92	66	41	15	89	63	36	09	82
7	20	95	69	44	18	92	65	39	12	84
8	23	98	72	47	21	95	68	42	15	87
9	26	201	75	49	24	98	71	45	18	90
10	29	04	77	52	25	90	74	47	21	93
11	32	06	80	55	26	03	77	50	24	96
12	35	09	84	58	23	06	80	53	26	99
13	38	12	87	61	35	09	83	56	29	1602
14	41	15	90	64	38	12	86	59	32	05
15	44	18	93	67	41	15	89	63	35	08
16	46	21	95	70	44	18	91	65	38	10
17	49	24	98	73	47	21	94	68	41	13
18	52	27	401	76	50	24	97	71	44	16
19	55	30	01	78	53	27	1100	73	46	19
20	58	33	07	81	56	30	03	76	49	22
21	61	25	10	84	58	32	06	79	52	25
22	64	38	13	87	61	35	09	82	55	27
23	67	41	16	90	64	38	12	85	58	30
24	70	44	19	93	67	41	15	88	61	33
25	73	47	22	96	70	44	18	91	64	26
26	76	50	25	99	73	47	20	94	67	39
27	78	52	27	602	76	50	23	97	69	42
28	81	56	30	05	79	53	26	99	72	45
29	84	59	33	08	82	56	29	100	75	48
30	87	62	36	10	85	59	32	05	78	50

A table of Sines

The Degrees of the Quadrant

M.		1	2	3	4	5	6	7	8	9
31	90	265	439	613	787	96	1135	1308	1481	1653
32	91	263	442	616	790	954	1138	1311	1484	1656
33	96	270	445	619	793	967	1141	1314	1487	1659
34	99	73	48	22	96	70	44	17	90	62
35	102	70	51	25	92	73	46	20	92	65
36	03	79	54	28	802	76	49	22	95	68
37	07	82	56	31	5	79	52	25	98	70
38	10	85	59	34	08	82	55	28	1501	73
39	13	88	62	37	11	85	58	31	04	76
40	16	9	65	40	14	88	61	34	07	79
41	18	91	68	42	16	90	64	37	10	82
42	22	97	71	45	19	91	67	40	11	85
43	25	300	74	48	22	96	70	43	1	88
44	28	03	77	51	25	99	72	46	18	91
45	31	05	80	54	28	100	75	48	21	93
46	34	08	81	57	31	0	76	51	24	96
47	37	11	85	60	34	0	81	54	27	99
48	40	14	88	63	37	1	84	57	30	1702
49	43	17	91	66	40		87	60	33	05
50	45	20	94	68	43	10	90	63	36	08
51	48	22	97	71	46	15	01	66	38	11
52	51	26	500	74	48	21	96	69	41	
53	54	29	03	77	51	25	98	7	4	16
54	57	31	06	80	54	29	101	74	47	19
55	60	34	09	82	57	33	04	77		21
56	63	37	12	86	60	34	07	80	5	25
57	66	40	15	89	63	37	10	82	5	28
58	69	41	17	91	66	39	13	85	59	3
59	72	47	20	95	69	41	16	88	61	34
60	74	50	23	97	71	43	19	92	64	36

A table of Sines.

The Degrees of the Quadrant.

M.	10	11	12	13	14	15	16	17	18	19
1	1739	1911	2082	2252	2422	2591	2759	2926	3093	3258
2	42	14	85	55	25	94	62	29	96	61
3	45	17	88	58	28	97	65	32	98	64
4	47	19	90	61	30	99	67	35	101	67
5	50	22	93	64	33	2602	70	38	04	69
6	53	25	96	67	36	05	73	40	07	72
7	56	28	99	69	39	08	76	43	09	75
8	59	31	2102	72	42	11	79	46	12	78
9	62	34	05	75	45	13	81	49	15	80
10	65	37	07	78	47	16	84	51	18	83
11	67	39	10	81	50	19	87	54	20	86
12	70	42	13	83	53	22	90	57	23	89
13	73	45	17	86	56	25	93	60	26	91
14	76	48	19	89	59	28	95	63	29	94
15	79	51	22	92	62	30	98	65	32	97
16	82	54	25	95	64	33	2801	68	34	3300
17	85	57	27	98	67	36	04	71	37	02
18	88	59	30	2300	70	39	07	74	40	05
19	90	62	33	03	73	41	09	76	43	08
20	93	65	36	06	76	44	12	79	46	11
21	96	68	39	09	78	47	15	82	48	13
22	99	71	42	12	81	50	18	85	51	16
23	1802	74	45	15	84	53	21	88	54	19
24	05	77	47	17	87	55	23	90	56	22
25	08	79	50	20	90	58	26	93	59	24
26	10	82	53	3	92	61	29	96	62	27
27	13	85	56	26	95	64	32	99	65	30
28	16	88	59	29	98	67	35	3001	67	32
29	19	91	61	31	2501	69	37	04	70	35
30	22	94	64	34	04	72	40	07	73	38

A Table of Sines.

The Degrees of the Quadrant.

M.	10	11	12	13	14	15	16	17	18	19
31	1825	1996	2167	2337	2507	2675	2843	3010	3176	3341
32	28	99	70	40	09	78	46	13	78	43
33	30	2002	73	43	12	81	48	15	81	46
34	33	05	75	46	15	83	51	18	84	49
35	36	08	78	49	18	86	54	21	87	52
36	39	11	81	51	21	89	57	24	89	54
37	42	14	84	54	24	92	60	26	92	57
38	46	16	87	57	26	95	62	29	95	60
39	48	19	90	60	29	98	65	32	98	63
40	50	22	93	63	32	2700	68	35	3201	65
41	53	25	96	65	35	03	71	37	03	68
42	56	28	98	68	38	06	74	40	06	71
43	59	31	2201	71	40	09	76	43	09	74
44	62	34	04	74	43	12	79	46	12	76
45	65	36	07	77	45	14	82	49	14	79
46	68	39	10	80	49	17	85	51	17	82
47	70	42	13	82	52	20	87	54	20	85
48	73	45	16	85	55	23	90	57	23	87
49	76	48	18	88	57	26	93	60	25	90
50	79	51	21	91	60	28	96	62	28	93
51	82	53	24	94	63	31	99	65	31	96
52	85	56	27	97	66	34	2901	68	34	98
53	88	59	30	99	68	37	04	71	36	3401
54	91	62	31	2402	71	40	07	73	39	04
55	94	65	35	05	74	42	10	76	42	06
56	95	68	38	09	77	45	13	79	45	09
57	99	70	41	11	80	48	15	82	47	12
58	1902	73	44	14	83	51	18	85	50	15
59	05	76	47	16	85	54	21	87	53	17
60	08	79	49	19	88	56	24	90	56	20

A Table of Sines.

The Degrees of the Quadrant.

M.	20	21	22	23	24	25	26	27	28	29
1	3423	3586	3749	3910	4070	4229	4386	4542	4697	4851
2	26	89	51	13	73	31	89	45	4700	53
3	28	92	54	15	75	34	91	48	02	56
4	31	94	57	18	78	37	94	50	05	59
5	34	27	59	21	81	39	96	53	07	61
6	37	3600	62	23	83	42	99	55	10	63
7	39	03	65	26	86	45	4402	58	13	66
8	42	05	68	29	89	47	04	61	15	68
9	45	08	70	31	91	50	07	63	18	71
10	47	11	73	34	94	52	1	66	20	73
11	50	13	76	37	96	55	12	68	23	76
12	53	16	78	39	99	58	15	71	25	78
13	56	19	81	42	4102	60	18	73	28	81
14	58	22	84	45	04	63	20	76	31	83
15	61	24	86	47	07	66	23	79	33	86
16	64	27	89	50	10	68	25	81	36	88
17	67	30	92	53	12	71	28	84	38	91
18	69	32	94	55	15	74	31	86	41	93
19	72	35	97	58	1	76	33	89	43	96
20	75	38	3800	61	20	79	36	92	46	98
21	77	41	03	63	23	81	38	94	48	4901
22	80	43	05	66	26	84	41	97	51	04
23	83	46	08	69	28	87	44	99	54	06
24	86	49	11	71	31	89	46	4602	56	09
25	88	51	13	74	34	92	49	04	59	11
26	91	54	16	77	36	95	51	07	61	14
27	94	57	19	79	39	97	54	10	64	16
28	97	60	21	82	42	4300	57	12	66	19
29	99	62	24	85	44	02	59	15	69	21
30	3502	65	27	87	47	05	62	17	71	24

A Table of Sines

The Degrees of the Quadrant.

M.	20	21	22	23	24	25	26	27	28	29
31	3505	3668	3829	3990	4149	4308	4464	4620	4774	4927
32	07	70	31	93	52	10	67	23	77	29
33	10	73	35	95	55	13	70	25	79	32
34	13	76	37	98	57	16	72	28	82	34
35	16	79	40	4001	60	18	75	30	84	37
36	18	81	43	03	63	21	78	33	87	39
37	21	84	46	06	65	24	80	35	89	42
38	24	87	48	09	68	26	83	38	92	44
39	27	89	51	11	71	29	85	41	94	47
40	29	92	54	14	73	31	88	43	97	49
41	32	95	56	17	76	34	90	46	99	52
42	35	97	59	19	78	36	93	48	4802	54
43	37	3700	61	22	81	39	96	51	05	57
44	40	03	64	25	84	42	98	53	07	60
45	43	06	67	28	86	44	4501	56	10	61
46	49	08	70	30	89	47	03	59	12	65
47	48	11	72	33	92	50	06	61	15	67
48	51	14	75	35	94	52	09	64	17	70
49	54	16	78	38	97	55	11	66	30	72
50	56	19	80	41	4200	57	14	69	22	75
51	59	22	83	43	02	60	16	71	25	77
52	61	24	86	46	05	63	19	74	28	80
53	65	27	88	49	08	65	22	77	30	82
54	67	30	91	51	10	68	24	79	33	85
55	70	32	94	54	13	71	27	82	35	87
56	73	35	96	57	16	73	29	84	38	90
57	75	38	99	59	18	76	22	87	40	92
58	78	41	902	62	21	78	35	89	43	95
59	81	53	05	65	24	81	37	92	45	97
60	84	46	08	67	26	84	40	95	48	5000

A Table of Sines

The Degrees of the Quadrant.

M.	30	31	32	33	34	35	36	37
1	5002	5153	5302	5449	5594	5738	5880	6020
2	05	55	04	51	97	40	82	23
3	07	58	06	54	99	43	85	25
4	10	60	09	56	5601	45	87	27
5	12	63	11	58	04	48	90	30
6	15	65	14	61	06	50	92	32
7	17	68	16	63	09	52	94	34
8	20	70	19	65	11	55	96	37
9	22	73	21	68	14	57	99	39
10	25	75	24	71	16	59	5901	41
11	27	78	26	73	18	62	04	44
12	30	80	29	76	21	64	06	46
13	32	83	31	78	23	67	09	48
14	33	85	34	80	25	69	11	51
15	37	88	36	83	28	71	13	53
16	40	90	39	85	30	74	15	55
17	42	93	41	88	33	76	18	57
18	45	95	43	90	35	78	20	60
19	48	98	46	93	38	81	23	62
20	50	5200	48	95	42	83	25	64
21	53	03	51	97	44	85	27	67
22	55	05	53	5500	45	88	29	69
23	58	08	56	02	47	90	32	71
24	60	10	58	05	50	93	34	74
25	63	13	61	07	52	95	39	76
26	65	15	6	09	54	97	39	78
27	68	17	66	12	57	5800	41	81
28	70	20	68	14	59	02	43	83
29	73	22	70	17	62	05	46	85
30	75	25	73	16	64	07	48	88

A Table of Sines.

The Degrees of the Quadrant.

M	30	31	32	33	34	35	36	37
31	5078	5227	5375	5522	5666	5809	5950	6090
32	80	30	78	24	69	12	53	92
33	83	32	80	27	71	14	55	94
34	85	34	83	29	74	16	57	97
35	88	37	85	31	76	19	60	99
36	90	40	88	34	78	21	62	5101
37	93	42	90	36	81	23	64	04
38	95	45	93	39	83	26	67	06
39	98	47	95	41	85	28	69	08
40	5100	50	99	43	88	31	71	11
41	03	52	5400	46	90	33	74	13
42	05	55	02	48	93	35	76	15
43	08	57	04	51	95	38	78	17
44	10	60	07	53	97	40	81	20
45	13	62	10	56	5700	42	83	22
46	15	65	12	58	02	45	85	24
47	18	67	15	60	05	47	88	27
48	20	69	17	63	07	49	90	29
49	23	72	19	65	09	52	92	31
50	27	74	22	68	12	54	95	34
51	28	77	24	70	14	56	97	36
52	30	79	27	73	17	59	99	31
53	33	82	29	75	19	61	6002	40
54	35	84	32	77	21	64	04	43
55	38	87	34	80	24	66	06	45
56	40	89	37	82	26	68	09	47
57	43	92	39	85	29	71	11	49
58	45	94	41	87	31	72	13	52
59	48	97	44	89	33	75	16	54
60	50	99	46	92	36	78	18	56

A Table of Sines

The Degrees of the Quadrant.

M.	38	39	40	41	42	43	44	45
1	6159	6295	6430	6563	6694	6822	6949	7073
2	61	98	32	65	96	24	51	75
3	63	6300	34	67	98	26	53	77
4	66	02	37	69	6700	28	55	79
5	68	04	39	71	02	31	57	81
6	70	07	41	74	04	33	59	83
7	73	09	43	76	06	35	61	85
8	75	11	46	78	08	37	63	87
9	77	13	48	80	11	39	65	89
10	79	16	50	83	13	41	67	92
11	82	18	52	85	15	43	69	94
12	84	20	54	87	17	45	72	96
13	86	22	57	89	19	48	74	98
14	89	25	59	91	21	50	76	7100
15	91	27	61	93	24	52	78	02
16	93	29	63	96	26	54	80	04
17	95	31	66	98	28	56	82	06
18	98	34	69	6600	30	58	84	08
19	6200	36	70	02	32	60	86	10
20	02	38	72	04	34	62	88	12
21	05	40	74	06	36	64	90	14
22	07	43	77	10	38	67	92	16
23	09	45	71	11	41	69	94	18
24	11	47	81	13	43	71	97	20
25	13	49	83	15	45	74	99	22
26	16	52	86	17	47	75	7001	24
27	18	54	88	19	49	77	04	26
28	20	56	93	22	52	79	05	28
29	23	58	92	24	54	81	07	30
30	25	61	94	26	56	83	09	32

A Table of Sines.

The Degrees of the Quadrant.

M	38	39	40	41	42	43	44	45
31	6227	6363	6497	6628	6758	6886	7011	7134
32	30	65	89	30	60	88	13	39
33	32	67	6501	33	62	90	15	39
34	34	70	03	35	64	92	17	41
35	36	72	05	37	66	94	19	43
36	39	74	08	39	69	96	21	45
37	41	76	10	41	71	98	23	47
38	43	79	12	44	73	6900	26	49
39	45	81	14	46	75	02	28	51
40	48	83	16	48	77	05	30	53
41	50	85	19	50	79	07	32	55
42	52	87	21	52	81	09	34	57
43	55	90	23	54	83	11	36	59
44	57	92	25	57	86	13	38	61
45	59	94	27	59	88	15	40	63
46	61	96	30	51	99	17	42	65
47	64	99	32	63	92	19	44	67
48	66	6401	34	65	94	21	46	69
49	68	03	36	67	96	23	48	71
50	70	05	39	70	99	25	50	73
51	73	08	41	72	6801	28	52	75
52	75	10	43	74	03	30	54	77
53	77	12	45	76	05	32	57	79
54	79	14	47	78	07	34	59	81
55	82	17	50	80	09	36	61	83
56	84	19	52	83	11	38	63	85
57	86	21	54	85	13	40	65	87
58	89	23	56	87	16	42	67	89
59	91	26	58	89	18	44	69	91
60	93	28	60	91	20	46	71	93

A Table of Sines

The Degrees of the Quadrant.

M.	46	47	48	49	50	51	52	53
1	7195	7315	7433	7549	7662	7773	7882	7988
2	97	17	35	51	64	75	84	90
3	99	19	37	53	66	77	85	92
4	7201	21	39	55	68	79	87	93
5	03	23	41	57	70	81	89	95
6	05	25	43	59	72	82	91	97
7	07	27	45	60	73	84	95	98
8	09	29	47	62	75	85	94	8000
9	11	31	49	64	77	88	96	02
10	13	33	51	66	79	90	98	04
11	15	35	53	68	81	91	7900	05
12	18	37	55	70	83	93	01	07
13	20	39	57	72	85	95	03	09
14	22	41	59	74	87	97	05	11
15	24	43	61	76	88	99	07	12
16	26	45	63	77	90	7801	09	14
17	28	47	64	79	92	03	10	16
18	30	49	66	81	94	04	12	18
19	32	51	68	83	96	06	14	19
20	34	53	70	85	98	08	16	21
21	36	55	72	87	7700	10	18	23
22	38	57	74	89	01	11	19	25
23	40	59	76	91	03	13	21	26
24	42	61	78	93	05	15	23	28
25	44	63	80	95	07	17	25	30
26	46	65	82	96	09	19	26	32
27	48	67	84	98	11	21	28	33
28	50	69	86	7600	12	22	30	35
29	52	71	88	02	14	24	32	37
30	54	73	90	04	16	26	33	38

A Table of Sines.

The Degrees of the Quadrant.

M	46	47	48	49	50	51	52	53
31	7256	7357	7491	7606	7718	7828	7935	8040
32	58	77	93	08	20	30	37	42
33	0	79	95	10	22	32	39	44
34	62	81	97	12	24	33	41	45
35	64	82	99	14	25	35	42	47
36	66	84	7501	15	27	37	44	49
37	68	86	03	17	29	39	46	51
38	70	88	05	19	31	40	48	52
39	72	90	07	21	33	42	49	54
40	74	92	09	23	35	44	51	56
41	76	94	11	25	37	46	53	58
42	78	96	13	27	39	48	55	59
43	80	98	14	29	40	49	56	61
44	82	7400	16	30	42	51	58	63
45	84	02	18	32	44	53	60	64
46	86	04	20	34	46	55	62	66
47	88	06	22	36	48	57	63	68
48	90	08	24	38	50	58	64	70
49	92	10	26	40	51	60	67	71
50	94	12	28	42	53	62	69	73
51	96	14	30	44	55	64	70	75
52	98	16	32	45	57	66	72	76
53	7300	18	34	47	59	67	74	78
54	01	20	36	49	49	69	76	80
55	03	22	37	51	62	71	77	82
56	05	24	39	53	64	73	79	83
57	07	26	41	55	66	75	81	85
58	09	28	43	57	68	76	83	87
59	11	29	45	58	70	78	85	88
60	13	31	47	62	71	80	86	90

A Table of Sines

The Degrees of the Quadrant.

M	4	5	6	7	8	9	60
1	8092	8193	8292	8388	8482	8573	8662
2	94	95	94	90	83	75	63
3	95	97	95	91	85	76	65
4	97	98	97	93	87	78	66
5	99	100	98	95	89	79	68
6	8100	01	8300	96	90	81	69
7	02	03	02	98	91	82	70
8	04	05	03	99	93	84	72
9	05	06	05	801	94	85	73
10	07	08	07	02	96	87	75
11	09	10	08	04	97	88	76
12	11	12	10	06	99	90	78
13	12	13	11	07	8500	91	79
14	14	15	13	09	02	93	81
15	16	16	15	10	03	94	82
16	17	18	16	12	04	96	84
17	19	20	18	14	06	97	85
18	21	21	19	15	07	99	87
19	22	23	21	17	09	8600	88
20	24	25	23	18	11	02	90
21	26	26	24	20	13	03	91
22	28	28	26	21	14	05	92
23	29	30	28	23	16	06	94
24	31	31	29	24	17	07	95
25	33	33	31	26	19	08	97
26	34	35	32	28	20	10	98
27	36	36	34	29	22	12	99
28	38	38	36	31	23	13	8701
29	39	40	37	33	25	15	02
30	41	41	39	34	26	16	04

A Table of Sines.

The Degrees of the Quadrant.

M.	54	55	56	57	58	59	60
31	81.43	82.43	83.40	84.35	85.28	86.18	87.05
32	44	45	42	37	29	19	06
33	46	46	46	38	31	21	08
34	48	48	46	40	32	22	09
35	49	49	47	42	35	23	11
36	51	51	48	4	36	27	12
37	5	53	50	45	37	28	13
38	55	54	52	46	39	29	15
39	56	56	53	48	40	30	16
40	58	57	55	49	42	31	18
41	60	58	56	5	43	33	19
42	61	61	58	5	45	34	20
43	63	6	60	54	46	36	21
44	65	64	61	55	48	37	24
45	66	66	63	57	49	38	25
46	68	67	64	58	51	41	26
47	70	69	66	60	52	43	28
48	71	71	67	62	54	4	29
49	72	74	69	63	55	44	31
50	74	74	71	65	57	46	32
51	76	7	72	66	58	47	33
52	78	77	74	68	60	48	34
53	80	79	75	70	61	50	36
54	81	81	77	71	63	53	38
55	83	82	79	73	64	54	29
56	85	84	80	74	66	55	40
57	86	85	82	76	67	56	4
58	88	87	83	77	68	57	43
59	90	89	85	79	69	59	54
60	91	90	87	80	71	60	64

A Table of Sines.

The Degrees of the Quadrant.

M.	61	62	63	64	65	66	67
2	8749	8832	8913	8990	9065	9138	9207
4	52	35	15	93	68	40	09
6	55	38	18	95	70	42	12
8	58	41	21	98	73	45	14
10	60	43	23	9000	75	47	16
12	63	46	26	03	78	49	18
14	66	49	28	60	80	52	21
16	69	52	31	80	83	54	23
18	71	54	34	11	85	56	25
20	74	57	36	13	87	59	28
22	77	60	39	16	90	61	30
24	80	62	41	18	92	64	32
26	83	65	44	21	95	66	34
28	85	67	47	23	98	68	36
30	88	70	49	26	9100	71	39
32	91	73	52	28	02	73	41
34	94	75	54	31	04	75	43
36	96	78	57	33	07	77	45
38	99	80	60	36	09	80	47
40	8002	83	62	38	12	82	50
42	05	86	65	41	14	84	52
44	08	89	67	43	16	87	54
46	10	91	70	46	19	89	56
48	13	94	72	48	21	91	59
50	16	97	75	51	23	94	61
52	19	99	78	54	26	96	63
54	21	8902	80	56	28	98	65
56	24	05	83	58	31	9200	67
58	27	07	85	61	33	03	70
60	30	10	88	63	35	05	72

A Table of Sines.

The Degrees of the Quadrant.

M.	68	69	70	71	72	73	74
2	9274	9338	9399	9457	9512	9565	9614
4	76	40	9401	59	14	66	16
6	78	42	01	61	16	68	17
8	80	44	05	63	18	70	19
10	83	46	07	65	19	71	20
12	85	48	09	66	21	73	22
14	87	51	11	68	23	75	24
16	89	53	13	70	25	76	25
18	91	54	15	72	27	78	27
20	93	56	17	74	28	80	28
22	96	58	39	76	30	81	30
24	98	60	20	78	32	83	32
26	9300	63	22	80	34	85	33
28	02	65	24	81	35	86	35
30	04	67	26	83	37	88	36
32	06	69	28	85	39	90	38
34	08	71	30	87	40	91	39
36	10	73	32	89	42	93	41
38	13	75	34	91	44	95	42
40	15	77	36	92	46	96	44
42	17	79	38	94	48	98	45
44	19	81	40	96	49	9900	47
46	21	83	42	98	51	01	48
48	23	85	44	9900	53	03	50
50	25	87	46	01	54	04	51
52	27	89	47	03	56	06	53
54	29	91	49	05	58	08	55
56	22	93	51	07	59	09	56
58	34	95	53	09	61	11	58
60	26	97	55	10	63	13	59

A Table of Sines.

The Degrees of the Quadrant.

M.	75	76	77	78	79	80	81	82
5	9663	9706	9747	9784	9819	9850	9879	9905
10	67	10	50	87	22	53	81	07
15	70	13	53	90	24	55	84	09
20	74	17	56	93	27	58	86	11
25	78	20	60	96	30	60	88	12
30	81	24	63	99	32	63	90	14
35	85	27	66	9802	35	65	92	16
40	89	30	69	05	38	68	64	18
45	92	34	72	08	40	70	96	20
50	96	37	75	11	43	72	98	22
55	99	40	78	13	46	74	9900	24
60	9703	44	81	16	48	77	03	25

The Degrees of the Quadrant.

M.	83	84	85	86	87	88	89
5	9927	9947	9963	9977	9987	9994	9998
10	29	48	64	78	88	95	98
15	31	50	65	78	88	95	98
20	32	51	67	79	89	96	99
25	34	52	68	80	90	96	99
30	36	54	69	81	90	96	99
35	37	55	70	82	91	97	99
40	39	57	71	83	92	97	99
45	40	58	72	84	92	98	99
50	42	59	73	84	93	98	99
55	44	60	75	5	93	98	99
60	45	62	76	85	94	98	10000

10000 The

The Sea-mans Kalender.

The Extraction of Rootes.

It is not unnecessary, before we do enter into this order and method of teaching how to extract a Root to shew the diuers kinds and their definitions: Wherefore you must know that of Rootes there are sundry sorts, according to the quantities from which they are deriued, as the Squares, Cubes, Squared Squares, Surd-solides, &c. for the numbers receiue their names of the said quantities, every quantity hauing his Rote, which may be called the first quantity. Because it is the side or beginning of the quantity whereunto it is set: Numbers of the second quantity are called squares of the third Cubes, of the fourth squared squares as before: wherein you may proceed infinitely if you will, but you shall seldome or neuer haue vse for the extractions of the Rote of any quantity more then Squares and Cubes: A Square number is the Product of any number multiplied in it selfe, and the Rote thereof is the multiplier whereby the same square number is produced: As for example, 4. is a square number comming of the multiplication of 2. in it selfe which is the Rote thereof.

A Cubick number is the product of any number multiplied in to it selfe, and the same product multiplied againe by the first number: As 2. multiplied by it selfe, is 4. that Product multiplied againe by 2. the first number makes 8. which is a Cubick number, and the Rote thereof.

A Squared square number, is produced of 3. multiplications, first any number by it selfe makes a square number, that product againe, by the first rote or multiplier, makes a Cubick number: and lastly, that product againe by the first figure or rote, produceth a squared square number, as 2. multiplied in it selfe makes 4. a square number, that againe by 2. makes 8. which is a Cubicke number, and then that product againe by 2. produceth 16. which is a squared square number: and the rote thereof is 2. A Surd-solide number is the product of a number multiplied 4. times by the rote thereof: as 1 2. is a sursolide number, the number whereof is 2. for 2 multiplied in it selfe is 4. that multiplied againe by 2. is 8. the same product againe by 2. makes 16: and lastly, the same product multiplied by the first number 2. makes 32. there-

The Sea-mans Kalender.

foze I conclude that 32. is a surd solide number, and the number 2. whereby the sayd number is produced, is the surd solide roote to the sayd number: And thus multiplying the last product by the first number or roote, you may proceed infinitely, but more then these are needesse, and as I sayd befoze, without any great or common vse.

Now foze the finding of the roote, it must be done according to the quantitie whereof it taketh Domination, as whether it be of a Square or Cube, or otherwise: which knowne, let vs proceed to the working thereof.

You must vnderstand that the order of extracting the roote of any quantitie, is not much vnlke to Diuision, differing onely in this, that whereas in Diuision the deuisor is knowne, but heere it is to finde: also in Diuision you alwayes keepe one deuisor, but in this, you must change your deuisor at each remauiing, which is at the finding of euery figure contained in the roote: Now therefore, I will lay down one generall way foze the extraction of the roote of all quantities whatsoever, which is done by certaine numbers applied to each seuerall quantity: which are these: For the Square roote in one number required, which is 10. for the Cube two numbers, which are 300. and 30. For the Squared Square, three numbers, viz. 4000. 600. and 40.

Thus hauing declared the kindes, numbers, quantities, and order of the extraction of all sorts of rootes, it followeth, that wee proceede to the practice thereof: And first, to extract the Square roote of any number, you must consider as befoze I haue sayd, that 20. is the number foze the same quantitie: Also you must learne by memory the iust Square of all the 9. vnities, which if you know not, this Table will stand in some stead: where you see that 1
against euery of the 9. vnities asfoze sayd, towards the right
hand, is the Square of that vnty against which it doth
stand: which knowne, set downe the number whereof you
would extract the Square roote, then vnder the last figure at
the right hand, put a prick, & then proceeding towards the
left hand vnder euery second figure put a prick, that done,
draw with your pen a quotient as in diuision: Now foze to
finde the roote of your giuen number, seeke the greatest
Square

The Seamans-Kalender.

Square number containd in the number over the first prick, that Square number take from the number over the sayd first prick, and set the remayner over it, the roote of which Square number put in the quotient for the first figure of the roote: that roote multiply by 20. the number for the Square roote: and then looke how often the product thereof may be taken from the number over, or to the left hand of the second prick, which put in your quotient for the second figure of your roote: but this is to be noted for a generall rule, that you must take no greater number for your second figure, then that the Square thereof added with the former product, may bee taken from the number over the said second prick: and also looke how many prickes are vnder your given number, so many figures must be in the quotient for the roote of the sayd number: When hauing found 2. figures in the quotient, if there bee any moze prickes, multiply the whole number in the quotient by 20. and seeke how often the product thereof may be taken from the number over or belonging to the next prick; which number put in the quotient, and adding the Square thereof to the former product, subtract the whole summe from the number over the said prick, and cancelling the said number as at each remoue you must doe, set the remayner ouer it, and if there be any moze prickes vndone, doe as you did before, alwayes multiplying the quotient by 20. thereto adding the Square of the last figure, and the totall summe being subtracted from the last remayner, if there rest nothing, it is a Square number or else not, which you may proue if you multiply the roote by it selfe squarely, for the roote being truely extracted, will produce the first given number. But because that examples are easiest for the vnderstanding, let 104976, bee the given number whereof I would know the Square roote, viz. what number being multiplied into it selfe, will produce the aforesayd number of 104976. Therefore first I set downe the sayd number, and vnder the last figure towards the right hand, which in this example is 6. I put a prick or point, another vnder the 9. and lastly another vnder 0. leauing one figure betwixt every prick, which done and the quotient drawne, the given number will stand thus: 104976.1 — whereby I see that the roote of the sayd number must consist of 3. figures, because it hath 3. prickes vnder it: then I take

The Sea-mans Kalender.

the greatest Square number is 10. it being the number belonging to the first prick toward the left hand, that I finde to be 9. which is produced of 3. multiplied squarely, therefore I put 3. in the quotient for the first figure of the roote, and the Square thereof being 9. I subtract from 10. the number ouer the first prick, and there rests 1. The order of which worke will stand thus :

where you see that the figures ouer the first pickc $204976 \overline{) 13}$
cancelled, there is 3. in the quotient for the first fi-
gure of the roote and 1. rest, which with the figures
betwixt it and the next pickc, makes 149. for the number of the
second pickc. Now for the second figure of the roote, I multiply
3. the roote already found by 20. and the product is 60. that I seeke
how often I may take from 149. the number ouer the second pickc
which I may doe 2. times, for 2. times 60. is 120. whereunto the
square of 2. which is 4. being added, makes 124. that subtracted
from 149. leaues 25. therefore I put 2. in the quo $\times 25$

quotient for the second figure of the roote, and cancel-
 ling the figures over the second prick, the remay-
 ner being put over it, the working thereof will
 stand in this order: where you see the quotient is
 23. for the two first figures of the roote, and the
 figures of the two first prickes being cancelled,
 there rests 25. which with the other figures be-
 twixt them and the third and last prick, makes
 2576. for the number over the last prick: note
 therefore, to finde the last figure of the roote, I
 multiply the roote already found, that is to say,
 32. 20. and the product thereof is 640. that I
 seeke how often it may be taken out of 2576. the
 number over the last prick, which may be done 4.
 times, for 4. times 640. is 2560. whereunto if I
 adde the square of 4. there will amount 2576.
 which because it may be taken from the number
 remayning over the last prick, I put 4. in the
 quotient for the last figure of the roote, and sub-
 tracting the former product of 2560. from the
 number over the last prick, which is likewise

80497613

X 25
104976|32

124 20
3

60
2

334
4

124

583
104978 | 324

124
2576

32
20

3576. there

The Sea-mans Kalender.

2576. there will rest nothing, therefore I cancell those figures likewise. and thereby conclude 104976. to be a square number, and 324. to be the roote thereof: the p^roofe whereof is by multiplying the roote into it selfe squarely: for if you multiply 324. by 324. the first given number of 104976. will be produced, the working thereof will be as aboue you may see,

$$\begin{array}{r}
 640 \\
 4 \\
 \hline
 2560 \\
 16 \\
 \hline
 2576 \\
 \hline
 324 \\
 324 \\
 \hline
 1296 \\
 648 \\
 972 \\
 \hline
 104976
 \end{array}$$

This example in my minde, might be sufficient with often vse and practice to bring perfection in this kind of Extractions, because that although the summe be neuer so great, it is done all by one manner of worke, yet neuertheless, if I did not thinke, that thou wouldest complaine rather of tediousnes of learning, then of the difficultie in teaching, I would giue another example: for varieties of examples makes the worke seeme the more easie, Therefore once againe: let 548730625. be a giuen number, whereof I would know the Square roote, first I put prickes or points vnder the giuen number in such order as you see, beginning at the last figure towards the right hand, and proceeding towards the left, leaving one figure vnpointed betwixt euery p^ricke, where you see that the whole giuen number consist of 5. prickes, therefore also many figures must your roote or quotient be: then drawing a quotient, I seeke the greatest square number in 5. which is the number ouer the first p^ricke, which greatest square number I finde to be 4. and the roote thereof 2. for two times 2. is foure, therefore I put 2. in the quotient, and taking 4. the square thereof from 5. the number ouer the first p^ricke, there will rest 1. which I set ouer 5. cancelling the said 5. the working whereof will stand as a gainst: then for the second figure of the roote I multiply 2. the first figure of the roote already found by 20. and the product is 40. that I seeke how often may be taken from 148. the number remaining ouer the second p^ricke, which may be done 3. times, for three times 40. is 120. whereunto the square of 3. being

The Sea-mans Kalender.

added makes 129. then I put 3. in the quotient for the second figure of the roote, and subtracting 129. the last product from 148. the number remaining over the second

pricke, there will rest, 19. which with the other figures betwixt them and the next prick, makes 1973. therefore I can sell the 148. and setting the remainder over it, I have 1973. for the number over the third pricke, 23. in the quotient for the 2. first figures of the root: now for the third figure of the root: I multiply 23. the roote already found by 20. the product is 460. which may be taken from 1983. the number remaining over the third pricke 4. times for 460. multiplied by 4. makes 1740. whereunto adding 16. the square of 4. the product is 1856. therefore I put 4. in the quotient for the 3. figures of the root, and subtracting 1856. from 1973. the number over the third pricke, there will remaine 117. which with the

other figures betwixt them and the next pricke, makes 11706. for the number over the fourth pricke, and there is in the quotient 234. for the roote already found the whole worke standing as above: A gaine, for to finde the fourth figure of the

root, I multiply 234. the root found, by 20. the product whereof is 4680. which may be taken out of 11706. two times, for 4680. multiplied by 2. makes 9360. which with 4. the square of 2. make in all 9364. the same being subtracted from 11706 the number remaining over the fourth pricke, there will rest 2342. which with the other figure betwixt them and the fifth and last pricke; makes 234225. for the number remaining over the last pricke, therefore making my subtraction, I set the remainder over it, and put 2. in the quotient for the fourth figure of the roote, as you may see in the

margin: then to finde the last figure of the root of this given number aforesaid, I multiply the whole roote already found, viz. 2342. by 20. the product is 46840. which may be taken from

$$\begin{array}{r} 548730625 \\ \underline{123} \end{array}$$

$$\begin{array}{r} 4 \\ \times 29 \end{array}$$

$$\begin{array}{r} 28917 \end{array}$$

$$\begin{array}{r} 548730625 \\ \underline{1234} \end{array}$$

$$\begin{array}{r} 4 \end{array}$$

$$\begin{array}{r} 129 \end{array}$$

$$1856$$

$$\begin{array}{r} 223 \end{array}$$

$$\begin{array}{r} 2891742 \end{array}$$

$$\begin{array}{r} 548730625 \\ \underline{2342} \end{array}$$

$$\begin{array}{r} 4 \end{array}$$

$$\begin{array}{r} 129 \end{array}$$

$$1856$$

$$9364$$

$$234225. \text{ the}$$

The Sea-mans Kalender.

234235. the number ouer the last picke 5. times, for 46840. multiplied by 5. makes 234200. whereunto if I adde 25. the Square of 5. the whole product will be 234225. which number is equall to the number ouer the last picke, thereto I put 5. in the quotient, for the last figure of the roote, and subtracting the whole summe of the last product, viz. 234235. from the number ouer the last point or picke, which is likewise 234225. there will remaine nothing, whereby I finde 548730625. the giuen number to be a Square number, and the roote therefore to be 23425. which is the number found out in the quotient, as in the working thereof you may more plainly perceiue.

For prooue whereof, if you multiply 23425. the root squarely into it selfe, the product thereof will be equall to the first giuen number.

I doubt not but to any indifferent conceite, these two examples will suffice as well as if I should contriue a whole volume thereof when it is so that the giuen number is a right Square number, but if the giuen number be not a Square number it is vnpossible for to finde an exact roote thereto, but that after the worke there will remaine something as a fraction or part of a number more to be added to the quotient: for the true and perfect valuation of which fraction or remainer, none as yet could attaine, but they haue set downe so nere a way for the extraction of the roote of any number not being a Square number, that thereby no great error may be perceived. For the knowledge and better vnderstanding of which let this be a familiar example: you know, that 16. is a right Square number, and the Square root thereof is 4. but if you would extract the Square roote of 18. you should haue 4. in your quotient likewise for the root thereof, but then there will rest 2. whereby you see that 18. is no Square number, neither can you know what fraction to make of it, by reason that you haue no certaine deuisor which might stand for Denominator to the Numerator or remainer: onely let this suffice, that to finde the nearest root thereof, the rule is thus: double the remainer for the Numerator and quaduple; viz. multiply the roote by 4. and thereto adde 1. for the Denominator to the said Numerator as in this example, to extract the nearest Square roote of 18. I finde 4. to be

$$\begin{array}{r} 18 \overline{) 417} \\ 16 \end{array}$$

The Sea-mans Kalender.

in the quotient, and 2. remaining, which 2. being doubled makes 4. for the Numerator, and 4. the roots being multiplied by 4. makes 16. and 1. added therewith, makes 17. for Denominator, whereby I say that $4\frac{1}{7}$ is the nearest Square root of 18. which may be found out, for if you reduce $\frac{1}{7}$. into one common Denomination, and then multiply them squarely, the product will be $17\frac{1}{2}$. which is but $\frac{1}{7}$. too little.

Thus having declared the order how to extract the Square root of any number: It resteth now that I shew the manner of extracting the Cube roots of any number: as for the principall uses thereof, you shall find in the generall practise of the Mathematickes.

To finde out the Cube roots of any given number, being a right Cube number, first pnt downe the given number, and as in the square number you put points or prickes: beginning at the right hand and so towards the left, leauing betwixt each point one figure void, so in the extraction of the roots of a Cube number, you must leaue two figures void or unprickt betwixt euery point, and as in the Square root, so likewise in this: looke how many points are vnder the given number, so many figures must be contained in the root thereof, which is also to be obserued in extracting the roots of any quantity whatsoever: these things being considered, it is also necessary, that you know the greatest Cubick number of euery of the 9, vnities, whereof the Table hereunder specifies maketh explanation: where you see that against each unitie standeth the Cube number thereof, which

being knowne, and the given number prickt,	1	1
with a quotient drawne as before I haue	2	8
shewed: to extract the Cube roots, you haue	3	27
2. numbers, viz. 300. and 30. but because the	4	64
working therof would be too long to expresse	5	125
in tearmes let 13824. be a given number,	6	216
whereof I would extract the Cube roots.	7	343
first I put downe that number aforesaid	8	512
with points vnder it, & a quotient in this or	9	729

der, 13824. whereby I see that the root thereof must consist of two figures, because so many points doe belong vnto the given number: for the first figure whereof I see the

The Sea-mans Kalender.

the greatest Cube number contayned in 13. the number ouer the first point towards the left hand, which I finde to bee 8. the Cube roote thereof, which is 2. I put in the quotient for the first figure of the roote and subtracting 8. from 13. rest 5. which I put ouer 13. cancelling the sayd 13. which done, the worke will be as below.

Now for to finde the second figure of the roote, I set downe the 2. numbers which serueth for the extraction of the Cube roote, viz. 300. 30. and against

30. I put the roote already found, which is 2. and against 300. the Square thereof, which is 4. these two figures I set towards the left hand of them, then I multiply 300. by 4. the figure which standeth against it, and the product is 1200. that I seeke how often I may take from 5824. the number ouer the second p[ri]cke, which I may doe foure times, therefore I put 4. in the quotient for the second figure, and vpon the right hand against 300. I set 4. the last found number in the quotient, and against 30. I put 16. the Square thereof: and vnderneath 30. I put 64. which is the Cube of 4. then multiplying all the figures which are in a row into one product, viz. 4. by 300. makes 1200. and that againe by 4. makes 4800.

for that product: then for the next, 2. by 30. makes 60. and that by 16. makes 960. for the second product, which I set downe together each vnder other. Lastly, because 64. hath no other number to be multiplied therewith, I put that downe vnder them, which done, I adde them altogether, and the totall summe is 5824. the same subtracted from the number ouer [the last p[ri]cke], leaueth nothing, whereby I see that 13824. is a Cubicke number, and the Cube roote therefore is 24. as you may more plainely see by the working thereof, which is put in the margine above, where you see that

$$\begin{array}{r}
 5 \\
 \times 3824 \quad | \quad 2 \\
 \hline
 8 \\
 4 300 4 \\
 2 30 16 \\
 \hline
 62 300 \\
 30 4 \\
 2 1200 \\
 \hline
 60 4 \\
 16 4800 \\
 \hline
 360 4800 \\
 60 960 \\
 \hline
 960 64 \\
 \hline
 5824.
 \end{array}$$

$$\begin{array}{r}
 8 \\
 \times 2824 \quad | \quad 24 \\
 \hline
 8 \\
 24 \text{ being}
 \end{array}$$

The Sea-mans Kalender.

24. being multiplied into it selfe, and that product againe by 24. the first multipler, the product is 13824. which is equall to the first given number.

Againe, seeing that examples are the easiest Method of teaching and plainest for understanding: let 12551868224. be a given number: whereof I would extract the Cube roote.

First having pyckit it and drawne a Quotient for the roote, thus 12551868224. I see that the roote must consist of 4. figures, so many pyckes being vnder the given number.

For the finding of which figures, I seeke first the greatest Cube number in 12. which is 8. the root whereof being 2. I put in the quotient, for the first figure of the roote, subtracting 8. 4

the Cube thereof, from 12. the number over the first pycke, rest 4. then for the second figure of the roote, I put downe 300. and 30.

thenumbers for the Cube root against 30. I set 2.

the roote found: and against 300. 4. the Square 4 300 3

thereof: and multiplying 300. by 4. the Product 2 30 9
is 1200. that may be taken out of 4551. the number over the second pycke, 3. times, therefore I put 3. in the Quotient, and likewise after 300. and the Square thereof which is 9.

after 20. and the Cube thereof which is 27. I put vnder 30. then I multiply all the numbers in the first row, each by the other, viz. 4. by 300. makes 1200. and the same Product againe by 3. makes 3600. which I set by it selfe: Then againe I multiply 2. by 30. is 60. and that againe by 9. makes 540. which I put vnder the other Product. Lastly, because 27. hath no number wherewith

to be multiplied, I set downe likewise vnder both the other, 540. and the 3. numbers being set in order one vnder another, 27.

as you see, I adde them altogether, and the whole product is 4167.

the same I subtract from 4551. the number over the next Pycke, 4167. and there will remaine 384. to ioyne with the number

5824 24

24

96

48

576

576

24

2304

1152

13824

12551868224 | 23

8

4 300 3

2 30 9

27

3600.

540.

27.

4167.

The Sea-mans Kalender.

ber ouer the 3. picke : which done, the worke will stand in this order as you see.

Now for the third figure of the roote I put 4284
 downe 3 000. and 30. as before, and against 225; 2868224 | 23
 30. at the left hand, I put 23. the roote already found, and against 300. the square thereof, which is 529. then multiplying 529. 4167
 by 300. the Product is 158700. which may 529 300
 be twice taken from 384868. therefore I 23 30
 put 2. in the Quotient for the third figure of the roote and likewise
 put 2. to the right hand of 300. and the square thereof which is 4. at
 the right hand of 30. and the Cube thereof being 8. I put under 30.
 which numbers will stand as above; then multiplying all the numbers in one row each by other, into one Product, viz. 529. by 300.
 makes 158700. and that againe by 2. is 317400. for the whole
 Product of that rowe, which I set downe by it selfe; then I multiply 23. by 30. is 690. and that againe by 4. is 2760. for the Product of the second row.

Lastly, because 8. hath no number with it, I put it downe under the other, and then adding all the three summes together, the product is 320168. the same taken from 384868. the number ouer the thrd picke, rests for the number ouer the last picke, 64700224. and in the Quotient, is 232. the whole worke being as you see above.

Now to find the fourth and last figure of the roote, I put downe the two numbers againe which serue for the Cube roote, viz. 300. and 30. At the left hand of 30. I put 232, the numbers in the quotient, and at the left hand of 300. I set this square of 232. which is 53824. in this order. Then multiplying 53824. by the product 53824.
 out is 16147200. which I seeke how often may be had 232.
 in 64700224. the numbers remayning ouer the last picke, that may be done 4. times : Therefore, I put 4. in the quotient, for the fourth and last figure of the roote, and also I set the sayd 4. at the right

$$\begin{array}{r}
 320168 \\
 6 \\
 4284700 \\
 22552868224 \overline{) 232} \\
 8 \\
 4167 \\
 320168
 \end{array}$$

The Sea-mans Kalender.

right hand of 300. and the Square thereof which 53824. 300. 4.
 is 16. at the right hand of 30. and the Cube 232. 30. 16.
 thereof being 64. I put right underneath 30. 64.
 which done, all the numbers will stand as above: Then multiplying
 all the numbers in each row, into their severall products, viz.
 53824. by 300. makes 16147200. that againe by 4. is 64588800
 which I set by it selfe: Then againe, 232. by 30. is 6960. the same
 Product by 16. makes 111360. which I put downe under the
 other.

Lastly, because 64. hath no other number to be multiplied there,
 with, I put it downe likewise, under the other two numbers, and
 adding the three products together, the whole summe thereof will be
 64700224. which being subtracted from the number remayning
 over the last prioke, leaves nothing: So haue I in the Quotient
 3324. for the Cube root of 12551868224. the given number: the
 whole worke whereof, is here set downe in the Margine. For the
 proofe whereof if you will multiply the roote: viz. 2324. Cubickly
 in it selfe, the Product thereof will be equall with the first given
 number, as for example you may see in the working.

Where you see, that 2324. the root being multiplied into it
 selfe Squarely, and then likewise the whole product thereof againe
 by the same roote, 2324. The totall summe amounting thereof,
 12551868224. is the first given number.

But when you haue a number given to extract the Cube roote, and the foresaid given number be not a right
 Cube number, whereby you cannot come to any perfect root thereof,
 but that there will remaine some fraction or broken number after
 your said extraction, onely the manner to extract the nearest roote of
 a number not Cubical, as most writers doe affirme, is thus:

The difference betwixt the Cubicke number of the roote, and
 the Cubicke number of a number more then the roote, by an unitie
 shalbe the Denominator to the remainder, 1 added also thereto:

As for example: Let 12. be a number given, which not being
 a right Cube number, I would finde the nearest roote thereof: first
 the greatest Cubickenumber in 12. is 8. the Cube roote whereof
 being 2. I put in the quotient, and subtracting 8. the Cube thereof
 from

The Sea-mans Kalender.

from 12. there will rest 4. which 4. being ouer, sheweth $\frac{4}{12}$. is no Cubick number; therefore adding 1. to 4. makes 5. which I put for the Numerator: and to find the Dominator thereto, I set downe the Cube 2. the root found, which is 8. and likewise 27. the Cube of 3. which is a number more then the root by 1. then subtracting the one from the other, viz. 8. from 27. leaues 19. for the Dominator: By which reason the nearest Cubick root of 12. is $\frac{4}{19}$. which being reduced, and multiplied Cubickly, makes $11\frac{1}{19}$. the same abeuiated, makes 11. and very nere $\frac{4}{19}$ and it should be 12. therefore the error is $\frac{1}{19}$. too little, which although in this is no great error, yet in a great summe the error would be very much: Therefore for those which desire a more exact & perfect extraction of the square or Cube roote from numbers not being right square or Cubick numbers: Master Record in his Whetstone of wit, setteth downe an exact way (but being tedious) which is thus: For the square roote, adde to the giuen number so many times 2. Ciphers, as you desire the nerenesse of the roote: And for the Cubick root so many times 3. Ciphers, as you desire the exactnesse of the root thereof: and vnder the said Ciphers, put prickes in such order as before is taught: and then marke how many prickes there is ouer and besides the prickes of the giuen number: and then extract the root from all those Ciphers in such order as you did before: for if there be 1. more the root shall be tenths and the remainder parts of $\frac{1}{10}$. if there be two points or prickes ouer, more then the giuen number, then the root shall be hundredths; and the remainder parts of $\frac{1}{100}$. if 3. prickes be ouer, the root shall be thousands and the remainder parts of $\frac{1}{1000}$: and so you may come to a very nere roote, but not to any exact or perfect roote, vnlesse the giuen number be a right square or Cubicall number.

A Declaration of the Tables of Longitude and Latitude of places following.

The Tables hereafter following shewing the Longit. and Lat. of places, viz. of Kingdomes, Prouinces, Cities, Isles, Capes, Bayes, Riuers, and Mountaines, especially the most principall of them.

The Sea-mans Kalender.

them in the whole world, are gathered from the latest Descriptions, Maps & Charts, as well vniuersall as particular: who albeit they differ greatly in Longitude, yet in Latitude most of them agree: and also hauing a respect to the beginning of each of their severall Longitude, they come all to a neare agreement: For some beginning their Longitude at the Westermost part of Africa, makes the Longitude of London to be about 10. degrees 20. minutes: others beginning at the Canary Islands, makes the Longitude of London 18. degrees: others more Westward, make it 19. degrees 30. min. and Iodocus Hondius beginning the Meridian at the Ile Pico, one of the Azores, makes London to be in Longitude 17. deg 40. min. but I following M. Emery Molineux, according to his great Globes, doe account the Longitude from the Westermost parts of St. Michaels, another Ile of the Azores, the midst of which Ile is, 50. min. in Longitude, and from the Westermost part thereof the Longit. of London is 25. deg. 40. min. which in effect is not much different from any of the others: Note that the Longitude is counted from the Meridian passing over the aforesaid place Eastwards into a continuall progression, to the end of 360. which is the whole Circumference of the world. Latitude is counted from the Equinoctiall to the end of 90. deg. on each side thereof: and where the letter S. is after any number, it shewes the place to haue so many degrees and minutes of South Latitude, all the rest hauing no letter adioyning, haue North Latit. the whole being set in Alphabetical order for the readier finding of any place therein contained: and where the Longitude and Latitude of any thing done is set downe, noted by this sillable Rex, it expresseth the middle thereof. Further at the end of such places as begin with one letter, is left a space wherein the Traveller may insert such places, whereof the Longitude and Latitude is to him knowne, and not herein expessed.

A Table

A Table of the Longitude and Latitude of all the Notable places of the World.

A	Longit.	Latit.	A	Longit.	Latit.
A					
A Cupulco	270	18	Alicoa	74	13 21 S
Acartij an Il.	329	52	Alicur	44 21	38 29
Azores an lland	357	39	Alima	108 51	31
Achaguas	101 30	5 30 S	Alleleuia	70 21	10
Achin	132 30	4 40	Almedina	34	33 41
Aden	81 12	13	Alpes a mountain	41 29	47 29
Adia	50 11	25	Alfigubas	147 11	38 41
Adu	105 41	5 41 S	Amazen	45 29	12 41
Egypt	64	30	Amazons Reg.	323	13
Africa Reg.	40	10	Las Amazona	312 29	13 29 S
Agonata	162 21	38	Ammen	59 41	27 11
Agragam	144 29	8 21 S	Amsterdam	33	51 29
Aguada segura	253 29	24	Auerie a mount	116	54 9
Aqua la de pozos	245 20	28	Ancona	63 11	1 11
Alina a mountain	98 41	54 20	Ancona	43 29	43 51
Alacranes	283	5 21	Amboina	161 54	3 20
Alagoa	58 41	29 41 S	Abona	164 30	6 10 S
Albion noua	235	1 50	Amiona	75 20	12 40 S
Albiron	109 29	25 29	Andernopoly	58 11	44 41
Alboram	25 29	35 29	S. Andre	170 29	12
Albrough	26 25	52 20	S. Andre	22 11	56 21
Alcipo	72 29	38	S. Andreas	62 11	61 11 S
Alcada	23	4 40 29	Las a negadas	296	50
Alexandria	65	1 31 21	Angier	24 41	47 35
Alexandria	73 11	36 21	Anglesey	19 51	54
Algaziu	16	0 29	Anglia Reg.	23	53
Algiero	33	1 35 21	Angolefme	27	1 46
Alguescet	63 41	26 51	Antiochia	300	5 6 40
Alicante	28 41	39	Antipara	74 2	25 20 S
			Antwerpen	31 20	50 30

A B	Longit.	Latit.	B	Longit	Latit.
Arabia felix	83	0 21 0	Balsera	82 4	31 10
Arabia defart	77	0 30 0	Bamberg	39 15	50 10
Armenia Reg.	76	0 41 0	Bandu	173 30	33 0
Amoltus mount	35	0 11 30 S	Bax delos pergos	345 30	20 0 S
Asention	353 20	18 50	La Barbada	192 50	1 50 S
La ascention	15 30	8 0 S	Barlingas	16 20	39 30
Africa Reg.	85	0 36 0	Barnagosfos Reg.	70	0 13 0
Athens	56 10	40 0	S. Bartholome	194 30	14 0
Auero	17 30	41 10	Basell	37 10	47 50
Augustine	293	0 29 50	Beciasa	65	0 10 30
Ausbourg	38 40	48 30	Beil	76 15	27 10
Azura a mountain	59	0 22 40	Belef	69	0 51 40
Amiens	28 30	49 40	Belisse	21 30	47 0
B.			Belt	52 40	50 0
B Antam	140	0 5 40 S	Bengala Reg.	126	0 26 30
Babylon	82 20	33 0	Benichao	136	0 3 50
Babell mandell	80	0 12 50	Benin Reg.	41	0 7 40
Bachu	88 50	42 0	Bepirus a mount	142	0 34 0
Bactriana Reg.	115	0 38 30	Bepirus a Riuer	138 20	34 0
Bagasus a lake	77 10	50 40	Berga	40 10	62 50
Baharam an Ile	87 20	27 30	Bergeh	30 30	60 50
Bayes			Barwick	22 50	55 50
Bay anegada	319 50	40 20 S	Bethle	38 50	25 40
Bay debaxos ane-	321 30	39 50 S	Baifer Reg.	50	0 4 0
gados			Braligrod	58 20	47 30
Bianza	149 25	3 0 S	Bilbao	23 30	43 0
Batauia	123	0 3 20 S	Blaskey	12	0 51 40
Bay a dalagoa	56 10	32 10 S	Blaues	31 10	42 0
Bay de fumos	240 20	36	Blauet	21 15	47 50
Bay de S. Migell	39 30	8 40	Bloe	5 30	67 0
Bay ocfinora	312 30	41 0	Borneo	131 30	5 10
Bay de plinos	233	0 14 30	Borntholm	40 50	55 30
Bay langos	18	0 37 30	Bouenbergen	34 20	16 30
Bacalaio	335	4 48 28	Brandenberg	42 30	52 50
Bayona	17 20	42 10	Brasil	5 10	51 20
Bayone	25 30	44 0	Brasilia Reg.	345	0 10 0 S

B C	Longit. Latit.		C	Longit. Latit.	
Braua	74	30 0 30	Cap braua	275	1 27 29
Brest	20	0 48 30	Cap de breton	331	1 45 41
Bruage	25	30 45 50	Cap cameron	287	31 25 41
Bruges	29	0 51 10	Cap comerin	115	15 7 30
Buda	48	0 47 20	Cap Cantin	17	1 32 11
Burdiaux	26	0 45 10	Cap de S. Cather.	41	1 1 1 S
Bristowe	22	50 51 35	Cap de cro	31	29 43 11
Brachipult point in Wales	21	25 53 0	Cap croce	63	21 48 21
Bachapto	31	0 59 50	Cap de fierto	281	21 29 21
Brussels	30	50 51 0	Cap de sperance	324	29 51 1
Barcelona	28	15 41 10	Cap des domingo	315	21 46 41 S
Burlings	16	0 39 38	Cap falso	41	31 34 40 S
			Cap feare	305	11 32 29
			Cap felix	84	29 14 11
			Cap finis terre	16	1 43 11
			Cap Florida	293	21 25 29
			Cap formoso	28	1 5 1
			Cap froward	302	39 53 21
			Cap de gato	26	39 36 51 S
			Cap de S. Helena	326	11 36 11
			Cap de santiago	309	1 37 29
			Cap S. Iohn	62	29 67 29
			Cap de Krin	13	1 53 41
			Cap de S. Maria	77	29 24 1 S
			Cap de Maio	82	52 15 51 S
			Cap de S. Maria	327	11 35 11 S
			Cap de S. Maria	9	41 21 41
			Cap de la Mola	36	51 6 29
			Cap de nombre de Iesus	308	11 53 1 S
			Cap ortegall	18	29 44 11
			Cap de palmas	348	11 1 19
			Cap de S. Paul	32	0 5 50
			Cap de pescadores	277	40 28 0
			Cap del plate	352	50 5 0 S
			Cap primero	42	30 2 20 S

C	Longit.	Latit.	C	Longit.	Latit.
Cap de 3. points	28 30	55 20	Casma ariuer	121 40	61 0
Cap de puntas	315 20	10 40	Castrum portugal	57 10	20 20 S
Cap daquillius	42 1	34 30	Cazan	86 20	56 30
Cap de Razo	334 30	46 20	Chaga	56 0	6 20 S
Cap salida	74 0	26 10 S	Chialo	56 20	7 0 S
Cap despigiel	353 20	7 20 S	Chilimazata	294 30	6 30 S
Cap de stauola	12 20	54 0	Chio	58 30	40 30
Cap Torriga	11 3	18 20	Chiguifamba	305 30	17 0 S
Cap la vela	305 1	51 50	Coale	65 0	21 30
Cap S. Vincent	302 20	53 40	Coila	48 20	3 10 S
Cap de Virgin M.	308 0	52 10 S	Cora	85 10	19 20
Cap de vittoria	297 30	52 0 S	Coronades	296 30	45 0 S
Cap passaro	46 29	36 51 S	Corpo santo	84 10	7 30 S
Cap refalgate	96 21	22 21	Cumana	313 30	7 0
Cap raso	217 41	8 0	Cusco Reg.	297 20	13 30 S
Cap roxent	16 29	18 51	Cales in Spaine	20 51	36 10
Cap roxo	11 1	12 0 S	Cambalu	161 11	51 40
Cap of good hope	32 29	34 40	Canada	305 11	50 21
Cap del spirito sa	161 11	13 11	Canaria	9 29	27 21 S
Cap S. Vincent	17 0	37 0	Canda	59 29	35 21
Cap Verd	9 51	14 20	Caribes	316 11	7 0
Cap de bonavesta	334 21	49 11	Cartagena	300 1	11 20
Cap Walsingham	321 1	63 41	Cartagena	28 21	38 20
Campon Reg.	136 1	47 0	Cartago	299 29	3 11
Cairo	67 29	30 0	Casena Reg.	38 21	17 11
Calamita	67 41	48 10	Casser Reg.	132	47 1
Caldy	20 1	51 40	Cataio Reg.	150 1	53 1
Calcut	112 41	10 29	Catnes	22	58 29
Calice in France	29 10	50 40	Carwicke	41 11	69 11
Calibia Reg.	42 10	36 20	Chester in Engl.	21 29	53 51
California	253 0	30 0	Chichester	24 11	51 0
Camanor	300 20	16 30 S	Chidlies cape	326 41	67 29 S
Cambaba	150 0	8 10 S	Chily Reg.	305 0	30 1
Cambaya	110 0	22 0	Chirman Reg.	96 0	26 29
Gamboya Reg.	142 20	11 40	Cirena	53 29	32 0
Capiapa	304 50	34 0 S	Cypres	68 4	37 30

C D	Longit.	Latit.	DE	Longit.	Latit.
Clearmont	30 55	45 51	Derwinda	47 51	57 26
Cocas a mountain	79 0	47 29	Deuenter	33 25	51 51
Coechin	114 0	9 14	Diep	28 41	49 29
Callao Reg.	310 0	16 0 ^S	Dires cape	321 29	64 51
Colmogory	62 41	63 41	Dominica	319 41	14 0
Colne	34 0	51 41	Dona riuier	75 0	53 21
Commania Reg.	86 0	51 0	Donecz a riuier	71 0	51 0
Congu	147 21	49 11	Dorow	58 0	51 29
Coninxberg	49 11	55 29	Deuer	28 11	51 0
Constantinople	61 1	44 40	Dublin	16 41	53 11
Copen hage	38 29	55 51	Dumaran	150 0	8 41
Corasau Reg.	108 1	37 0	Duy	34 29	59 21
Corke in Ireland	15 41	51 41	Duyhe	56 29	50 29
Corfuān Iland	22 0	39 19	Dams straights	324 1	64 0
Coriath	54 21	39 0	Darby	24 5	52 55
Corfica	38 11	42 0	Dunkerke	29 10	51 12
Corum Reg.	230 0	51 0	E		
Cracow	48 29	50 0	E Baida	60 1	25 29
Cuba	196 0	31 41	E Edenbrough	22 1	55 51
Earle of Cumber- lands Iles	316 0	63 21	Ely	25 20	52 40
Cusitan Reg.	87 0	32 0	Elior	26 20	10 10
Conough	15 35	53 45	Queene Elizabeths forland	337 0	61 30
Cambridge	25 50	52 14	Emden	34 10	53 10
D			Ens	43 0	48 30
D Angali Reg.	78 0	11 0	Ens	74 10	37 30
Diu	107 3	20 42	Ephesus	60 30	39 40
Damon	108 8	19 20	Ergas	86 0	8 0
Dabol	109 6	17 45	Euboya	56 13	1 0
Dawina	74 30	62 10	Euphrates	76 40	50 0
Dargeroote	48 41	59 41	Europa Reg.	55 0	51 0
Dalacia	77 0	14 21	Exeter	22 10	50 0
Damascus	74 29	33 0	Enchuisen	21 40	52 54
Danzicke	46 0	55 0	F		
D. Darcies Isle	327 51	68 21	F Alsterhood	40 0	56 0
			Famagosta	69 20	57 30

F G	Longit.	Latit.	G	Longit.	Latit.
Barrollones	294 20	11 40 S	Garnesey	22 20	49 40
Bargana	114 40	46 0	Gaza	70 50	33 10 S
Barre	16 20	61 30	Gamba	64 40	17 30 S
Cap fatache	86 50	15 40	Gargiza	72 40	12 0 S
Caso	75 50	45 40	Gemenacota	118 40	6 0
Carnasa	38 10	30 10 S	Gencua	33 40	46 20
Fernandobuck	351 40	9 20	Genua	37 50	45 0
Fees Reg.	21 50	32 50	Genua	15 20	16 0
Fierro	6 20	26 30	Gerguth Reg.	153 0	57 0
Finmarke	47 0	69 30	Germanarco	40 0	51 0
Flamborough head	20 54	0	Getleluin	24 30	32 20
Flensburgh	36 40	55 0	Genera	7 30	26 30
Fleccory	32 0	58 0	Ghira riuier	25 30	22 0
Flye	32 0	53 33	Giamber	18 1	33 41
Florence	41 10	43 40	Gilberts found	326 51	67 1
Flores Iland	353 40	39 20	Giras a riuier	41 21	20 11
Florida Reg.	292 0	31 0	Galloway	15 49	53 15
Flocen	38 40	46 30	Goa	102 21	15 14
La formanios	310 30	60 40	Glosgow	29 0	57 0
Formentera	31 10	38 50	Golfo de benngal	125 0	15 0
Forteuentura	11 0	28 0	Golfo de S. Helen	48 41	33 29 S
Foyle	15 50	55 30	Golfo de la India	44 21	3 14 S
Frailes	314 30	11 20	Golfo de los negi	350 30	2 0 S
Franckfort	36 30	50 0	Golfo del Rey	40 41	5 30 S
Frisland	351 30	62 0	Golfo de todos Santos	345 30	1 41
Forbithers strait	331 20	64 0	Golfo de S. Anto.	46 20	26 0 S
A furious ouerfall	322 30	60 0	Golfo frio	45 30	20 0 S
Farre Ilands	17 0	62 10	Goteland	45 21	57 30 S
Farnill Ile	24 45	60 0	Gozo	58 20	34 41
Ferando	146 0	32 35	Granda	318 20	11 0
G			Granata	23 30	38 0
G Ago Reg.	25 0	8 30	Grecia Reg.	54 0	40 0
Galathia	37 20	37 0	Gratiosa	357 30	39 2
Gambra a riuier	12 0	13 1	Groninghen	32 11	53 0
Gane	30 20	50 40	Groenland	0 0	75 0
Garamantica	51 30	16 0			

GH	Longi	Latit.	I	Longit.	Latit.
Groy	21 0	47 21	I		
Guinea noua	80 0	5 0 S	I Ambic	121 30	1 15 S
Guinea Reg.	18 0	9 0	I Iacatra	140 0	6 0 S
Gunagona	67 30	6 0	Iamaica	238 29	72 0 S
Gibraltar straight	21 30	35 0	Iasques in Persia	44 0	25 40
H			Iapan	169 0	38 0
Hales Iland	337 30	63 0	Iarsey Iland	23 0	49 20
Haliber	78 41	21 1	Iaua maior	140 0	9 0
Halicz	52 51	48 41	Iaua minor	151 0	8 0
Hambrough	37 11	53 21	Iazin	77 30	20 30
Hartlepoole	24 0	55 21	Iapara	141 20	7 40
Harwich	27 29	52 0	Icico	73 1	33 0
Hauana	292 11	23 0	Ierusalem	72 21	33 0
Hebrides	15 20	58 0	Iimens a riuer	105 0	27 0
Heidelberg	36 0	49 0	Imaus a moun- taine	128 0	39 0
Heist	23 29	46 9	India Orientall	135 0	26 0
Heishant	19 29	48 41	Indus a riuer	115 29	26 50
Heptapolis	324 29	25 21	Inspurg Ilands	40 41	47 9
Hercules pillars	69 21	32 11	The three Ilands	169 21	40 20
Helichland	33 51	66 0	Ile d'eaues	310 30	11 30
Hercania Reg.	100 0	40 0	Ile d'eaues	173 50	4 30
Hispania Reg.	25 0	40 0	Ile de bastinado	293 30	10 20
Noua Hispania	280 0	13 29	Ile braua	1 20	12 50
Hispaniola	306 0	18 29	Illas de corales	194 40	9 4
Holindall	36 11	51 1	Ile de fierro	178 0	37 21
Hontfoort	48 30	59 1	Ile del fuego	22 0	14 41
Horne	12 10	66 10	Ile de los fuegos	181 29	22 0
Hull	25 21	53 41	Ile de los Galope- gos maiores	281 10	4 10
Hungaria	50 0	48 1	Ile de los Galope- gos menores	277 30	1 10
Hidalpes a riuer	124 0	33 21	Ile de Hombres blancos	169 20	5 41
Hipasis a riuer	124 0	33 1	Ile de S. Iago	158 20	8 0
Holin head	15 0	55 15	Ile de S. Iuan	325 29	42 0
Hureford	12 38	52 12			
Heel of Danthick	46 10	55 40			

I	Longit.	Latit.	I K L	Longit.	Latit.
Ile de los Ladrones	177 21	15 11	Isebella	305 21	18 51
Ile de los Lobos	307 41	40 21	Iland	8 0	66 0
Ile de S. Maria	296 29	37 2	Italy Reg.	42 29	43 0
Ile de martin vaz	11 21	21 1	Ireland	16 0	53 29
Ile de May	4 29	13 29	Iucatan Reg.	28 30	18 c
Ile de S. Michael	0 0	29 29	Iugor	138 0	7 50
Ile de Negros	155 29	10 39	Iuica	31 21	39 30
Iland of fowles	33 40	50 0	Ialibella	66 0	1 30
Ile de Orleance	312 0	50 29			
Ile de Paiaros	314 0	12 41	K		
Ile de Palmas	163 21	6 0	K Almuchy in	9 5	51 0
Ile de Paxaros	198 51	8 51	Tartaria		
Ile de Paxaros	234 21	18 0	Karakithath Reg.	119 0	51 0
Ile de Pearles	289 1	7 0	Cafakky Tartaria	103 0	51 0
Ile de Pinos	292 21	21 29	Kithais	110 0	57 0
Ile de Rees	1 20	25 2	Kithay a Lake	123 31	53 0
Ile of Salt	5 0	16 29	Kola	54 51	69 0
Salomon Iland	204 40	10 0	Kolenig	4 11	65 10
Ile of the Sunne	342 0	10 29	Kofar a riuer	96 40	49 0
Ile S. Thomæ	38 0	0 0	Kintale	19 30	56 45
Ile Saint Thomas	252 0	20 11	Kinsaile	15 3	52 35
Ile de Verde	353 51	45 29	L		
Ile de S. Vincent	175 50	8 0	L Acierna	24 50	39 30
Ile de S. Vincent	73 21	20 29	L Ladena	53 30	41 31
Ile de S. Catalina	334 10	27 30	Ladoga	62 11	61 40
Ile de S. Cedros	240 30	29 50	Lago de los coro-	295 1	44 0
Ile de farnan laro	354 20	2 20	nadus		
Ile delima	295 10	22 0	Lampesa	36 21	23 0
Ile fecas	46 20	29 30	Lanearocca	11 41	29 30
Ile de Tristande	26 30	36 0	Lanow	51 11	52 20
Acunia			Laredo	22 51	43 0
Ioam	135 0	7 29	Larifa	70 0	33 0
Iolofo	24 29	6 0	Larta	53 0	46 0
Ipswich	27 12	52 22	Lake de Gouleme	306 40	48 0
Ioppe	71 21	4 0	Lacus armibus	131 0	60 10
			Lacus falsus	137 40	47 30

LM	Longit.	Latit.	M	Longit.	Latit.
Leon	21 11	42 15	Macyra an Iland	62 0	19 40
Leon	28 3 41	11 21	Madera Ilands	8 11	31 29
Leopolis	52 51	49 2	Mæatis palus	71 30	40 29
Lepin	98 0	58 41	Magadaxo	78 0	5 11
Leguio Maior	165 0	28 0	Magalo	71 20	9 29 S
Leguio Minor	158 41	22 0	Maida	2 40	46 40
Lerida	28 21	41 30	Magallanes	305 0	53 25
Lester point	335 0	62 0	straights		90 0
Lima	296 41	23 30	Majorca Iland	31 31	30 0
Limonia	72 11	44 20	Malibrigo	178 51	26 0
Lymosa	43 29	4 5	Malaca	137 0	3 30
Lions	32 41	45 40	Malaga	23 51	37 21
Liorne	40 21	43 30	Maldanar an Iland	113 0	3 0
Lisboa	17 29	39 11	Malorca	31 31	30 0
Lyzard	18 30	50 10	Malta an Iland	46 0	35 31
Lodon	95 50	51 40	Man an Iland	19 0	54 51
London coast	326 11	72 0	Mosambiqua	70 0	14 32
Lepeso	74 1	49 41	Mogada	66 34	4 0
Loyre a riuer	24 14	47 41	Mamora	135 0	0 30 S
Longsound	34 30	58 55	Membasa	78 15	3 20
Lubec	38 2	53 51	Mangesia	61 91	41 29
Lucka	42 11	52 0	Mangforca	150 0	37 0
Lucky	64 0	58 21	Manica	62 51	23 29
L. Lumleys Inlet	320 0	61 0	Manicongo Reg.	46 61	5 0 S
Luna a Mountaine	50 0	16 0	Maniola Iland	30 0	40 0 S
Lundy	19 2	51 0	Merchant Ile	30 0	68 21
Lutzke	24 0	50 21	Mare de bachuor	92 0	45 0
Luzon an Iland	156 0	17 0	the Caspian sea.		
Lybia	33 0	23 30	Mare congelatum	345 0	64 0
Lin	29 25	52 48	Mare de India	120 0	10 0
Lincolne	25 25	53 22	Mare major	68 0	46 0
M			Mare mediterani-	59 0	35 0
M Ahoga	64 41	83 30 S	um		
M Machian	106 41	0 29	Mare rubrum	75 0	20 0
Machonta	93 51	33 41	Mare vermeio	255 0	26 0
Macfin Iland	93 30	75 30	Mare delzur	220 10	10 0

M	Longit.	Latit.	M N	Longit.	Latit.
Margarita	314 11	0 50	Memorancie	130 0	47 0
Marigalante	320 0	13 50	Mongull Reg.	160 0	91 30
Marnios	306 21	40 40	Monte de brand	47 11	30 15 S
Maroco	20 0	30 19	Mont frogoso	44 0	12 0
Marcellis	33 51	13 40	Mont negro	44 41	17 0
Matilio	23 29	30 20	Mont raleigh	20 20	65 0
Milford haven	20 25	51 48	Mont royall	301 0	45 40
Mastagan	30 1	35 2	Morea Reg.	54 30	38 0
Mazaker	167 0	33 0	Mosack	68 50	55 0
Madagascar	757 0	19 5	Mosambique Reg.	70 20	14 40
Maræ apana	312 10	8 0	Mulcouia Reg.	80 0	59 0
Meander a Moun- taine	152 0	31 30	Moskow	70 0	55 40
Malestreame	36 0	67 22	Mossa	84 30	35 0
Meb	46 29	34 40	Mossall	84 0	34 55
Medina cely	23 29	41 10	Mozena	24 20	34 30
Medina talnaby	37 0	27 20	Moa	96 36	21 31
Manilia	156 0	3 16	Minas	165 0	36 20
Medino	98 29	36 29	Mosceneck	69 50	51 30
Middleburg	29 40	52 0	Munster	35 0	52 10
Meissen	41 0	51 10	N		
Melinde Reg.	71 21	3 20 S	N Abarz	79 50	50 50
Melley Reg.	15 41	12 0	Naiman Reg.	140 0	64 0
Meluing	48 1	54 50	Naynen	31 10	50 0
Ments	35 51	50 0	Nantes	24 10	47 50
Mesnet	85 29	52 50	Napoly	45 0	41 0
Mesopotamia	78 1	35 0	Napoly	55 10	38 0
Messana	45 51	37 50	Napthaly	73 0	34 30
Metz	33 29	49 45	Narbona	30 20	43 20
Mien Reg.	136 1	31 0	Nardenborg	47 10	57 50
Mienskow	56 41	54 50	Narue	56 10	50 0
Millaine	58 29	46 10	Naruare	21 5	42 39
Minorca Ile	34 26	40 0	Naseph	110 30	43 0
Moldavia Reg.	55 0	46 0	Natolia Reg.	66 0	41 0
Molines	30 21	47 40	Nazareth	72 40	24 10
Mollucca Ilands	160 41	1 0	Newcastle	23 10	53 20
			Nicaria	59 30	39 30

NO	Longit	Latit.	O.P	Longit.	Latit.
Nicober an Iland	130 30	6 40	Oleans	28 29	48 2
Nicomedia	63 30	44 20	Ominus Ile	93 21	26 29
Nicopolis	56 30	45 0	Oria	59 51	54 21
Nieftot	57 40	59 50	Orfa	41 21	61 29
Nilus a Riuer	67 20	32 0	Otrona	44 29	42 40
Ninus	82 20	37 0	Otronto	49 24	40 21
Nifa	36 10	44 0	Oxenford	26 0	53 0
Niffa	45 30	50 30	Oya Reg.	75 0	13 0
Naze in Norway	31 0	58 5	Oftend	29 29	51 29
Noes a mountain	81 0	40 21	Oreng	30 35	43 35
Nolon	30 0	40 22	Oriance	27 52	47 42
Nombre de dyos	294 29	9 22	Oldfound	31 36	51 35
Norumbega	315 41	43 41	Orfordnes	28 0	52 15
Norweigh	35 0	62 2	P		
Nouogradec	57 11	53 2	P Aganfa	99 51	45 0 S
Nowgrod	65 29	52 41	Paito	290 30	5 10
Nowgorod	62 51	60 29	Palagofa	47 29	43 0
Nowgorod	80 2	55 21	Palandura Iland	19 8	11 0
Nubia Reg.	57 2	13 0	Palatia	60 51	39 21
Nubia a River	57 2	15 41	Palma Iland	6 21	28 0 S
Norenberg	39 9	49 29	Palona	105 10	2 0
Norwich	27 13	52 45	Pancer	120 0	41 0
O			Pambolona	24 29	42 41
O By a riuer	107 1	50 0	Panama	394 29	8 11
Occa a riuer	77 29	55 41	Pantanalua	42 50	36 29
Olant	43 29	57 0	Panuco	270 11	12 20
Olleron	24 29	45 29	Pauia	270 12	12 21
Olone	24 29	47 0	Patricks purgator	15 55	54 32
Oinagua Reg.	130 1	9 0 S	Parris	29 2	48 29
Omba	54 11	66 51	Parma	39 20	45 11
Onega a riuer	56 41	64 0	Passan	41 50	48 41
Onegaburgh	59 29	62 29	Paura	37 51	46 11
Opawkow	64 29	53 29 S	Paznalu	155 29	45 51
Orcades Iles	22 11	59 2	Pechora	65 51	67 0
Orellana	343 11	3 2	Pechora Castle	73 51	64 51
Orixa Reg.	119 1	19 2	Pegu	135 0	20 0

P	Longit.	Latit.
eim Reg.	132 0	51 29
erigo	323 11	43 21
ernou	53 29	58 41
eru Reg.	236 0	17 0 S
erusia	142 21	43 11
Pescara	34 29	30 11
Phillippina Iland	158 0	15 0
Palimbam	142 40	7 30
Pico	356 41	38 21
Picçora Reg.	317 0	10 2 S
Pigmea	148 41	32 2
Pilingu	144 21	40 2
Pina	296 21	3 1
Pinga	101 40	14 20 S
Port de los leenes	318 0	
Piramides	173 11	20 21
Pisa	40 29	43 41
Pizan	73 0	51 29
Plata	315 0	19 51
Plimouth	21 11	50 51
Poosko	48 11	52 41
Plotzko	57 29	57 41
Podolia Reg.	59 0	49 29
Poietiers	26 29	47 21
Poldauid	20 5	47 55
Polonia Reg.	53 1	50 0 S
Buen Porta	177 21	2 0
Port de canoas	239 21	36 41
Port de canolas	283 0	14 21
Port de la conce	45 41	4 21 S
Port de fire	313 0	47 41 S
Port famim	302 51	53 11 S
Port fremo	44 0	4 0 S
Port delgado	42 11	3 51
Port de S. Miguel	240 29	35 2
Port de nigillo	296 51	17 11

P Q	Longit.	Latit.
Port fallido	186 41	3 0 S
Port sancto	201 0	32 29
Port S. Vincent	337 21	23 51
Parga	42 29	50 0
Preslaw	45 11	51 11
Preslaw	46 41	49 45
Portland	22 40	50 40
Primsberg	48 30	55 11
Prussia Reg.	50 0	54 6
Ptolomais	66 41	29 40
Punto de S. Helen	290 11	2 11
Punto de S. Helen	325 21	37 30
Punt de S. Lucas	152 29	23 29
Priaman	118 0	0 20
Q		
Q Vanzu	157 29	44 10
Q Quelenfu	158 29	36 1
Quianfu	144 41	42 20
Quiloa Reg.	69 51	8 51
Quinza	153 0	40 1
Quito	293 11	0 11
Quiuira	233 0	43 40
R		
R Agufy	40 29	4 1
R Rameses	68 29	0 30
Rane	352 41	6 41
Rauenna	42 21	44 21
Rhodes	61 41	37 11
Ryatrech	94 41	40 0
Ribadeo	20 21	43 21
Riga	53 30	58 0
Reins	30 35	49 12
Riuers		
Rio de arebodelas	331 41	1 41
Rio de S. Angust	350 0	15 3 S
Rio de St. Barbara	326 41	34 1

R	Longit.	Latit.	R S	Longit.	Latit.
Rio del Brafill	348 21	17 11	Rye	27 29 51	1
Rio de los camarones	42 0	5 25	Rio de senega	14 25 15	6
Rio de Camaron	315 0	44 29 S	S Abarfa	154 51 45	0
Rio del campo	42 29	3 51	S Sablekan Reg.	114 0 34	0
Rio dangla	298 41	33 11	Sabron	84 51 45	11
Rio de Canno	42 29	0 41	Sacndebar	174 41 35	51
Rio dulce	316 29	52 0	Sagatin	95 29 58	21
Rio de S. demingo	353 0	7 51	Sala	49 41 48	0
Rio del estremo	340 41	22 59 S	Salamanca	20 29 40	51
Rio de Flores	287 19	29 0 S	Salasta	72 41 41	51
Rio del gado	34 21	6 21	Salina	45 0 38	29
Rio de Gigantes	278 29	29 0	Salsburg	42 0 48	21
Rio grande	301 11	11 0	Salstom	32 21 62	0
Rio grande	314 29	44 0	Saluado	321 21 5	0
Rio del guato	284 29	29 29	Samaría	72 21 47	41
Rio de la hacha	304 15	10 41 S	Sanderfons Tow.	320 0 55	29
Rio de S. Helena	348 41	10 29	Hope Sanderfon	326 31 72	41
S. Laurence Riuer	318 51	53 0 S	Sandry	162 51 53	0
Rio de Manicong	48 21	10 0	Sanfon	20 41 43	21
Rio del Oro	10 21	22 29	S. Cruix	334 21 43	29
Rio de Palmas	272 11	14 21	S. Davids	20 0 52	0
Rio panuco	271 51	22 29	S. Dominigo	307 11 17	51
Rio de perla	292 29	29 0	S. George	357 11 39	0
Rio de la plata	326 29	36 0	S. Helena	54 29 13	0
Rio primero	327 41	45 0	Santiago	264 29 20	29 S
Rio sancto	300 29	3 0 S	Santiago	298 11 32	11
Rio de spirito san.	381 29	31 0	S. Iago	175 29 1	0
The white Riuer	308 11	51 21 S	S. Iohn de luz	25 11 43	21
Rypon	35 29	55 21	S. Lazaro	71 0 11	21 S
Roan	27 41	48 51	S. Lucar	21 31 37	11
Rochell	25 29	46 41	S. Lucia	0 1 17	0
Romey	42 29	42 0	S. Mato	24 21 47	50
Roosewicke	40 21	54 0	S. Maria	82 29 17	0 S
Rostone	72 11	57 0	S. Maria	240 41 34	21
Russia	57 29	59 29	S. Maria	0 19 56	0

S	Longit.	Latit.	S	Longit.	Latit.
Maries	85	1 44 29	Sierraleona	19	8 8 40
Maries of Naza.	66	30 16 29	Skalholt	8	30 65 20
Martha	301	21 10 41	Sibier Reg.	99	20 59 30
Martin	321	11 51 0	Scicillia	45	0 37 30
Martins Ilands	293	40 46 51 S	Sidon	72	10 36 30
Mathewes	21	11 1 51 S	Siam	140	0 13 49
Michell	60	50 65 29	Sina a mountaine	75	0 20 0
Michael	0	50 38 5	Sinus mexico	280	0 26 0
Miguell	327	21 47 21	Sinus persia	85	0 29 0
Miguell	291	41 9 11 S	Sion	59	10 12 40
Miguell	168	0 24 0	Sipanto	45	30 41 50
Miguell	249	0 32 51	Siuill	18	6 37 45
Nicolas	69	0 54 0	Slaba	55	50 58 41
Nicolas	323	21 53 41	Slauonia	47	0 45 0
Nicolas	2	2 17 0	Slego in Ireland	15	35 54 15
Petro	64	29 0 29	Slowoda	68	20 64 30
Pol de Lyon	20	41 48 48	Slowoda	86	30 58 51
Samson	306	29 40 29	Smirna	60	21 40 29
Vincent	0	29 17 29	Snauell	2	30 64 21
Vincent	318	41 11 51	Sorlings	18	0 50 0
Sapom Iland	107	11 0 29	Spacado	46	50 45 21
Sarachi	84	29 44 11	Spier	35	30 49 21
Saragosa	16	11 41 51	Spina	60	50 43 29
Sardinia	39	0 40 0	Stad	30	40 61 41
Stayres Iland	174	11 46 30	Stapholt	2	20 65 41
Sauatapoly	75	29 47 21	Stetin	42	10 53 51
Scarborough	34	51 54 51	Stoby	52	30 44 0
Schotland	25	0 60 0	Stocholme	42	0 58 11
Scotland Reg.	20	0 57 0	Sraights of Tuma-	74	30 73 11
Segidin	49	0 47 11	chin		
Seames	19	29 48 21	Seuedia Reg.	40	0 60 0
Senega Reg.	13	0 24 0	Sumatra an Iland	134	0 0 0
Serneti Reg.	106	29 33 29	Soor	84	45 23 5
Sabolisher	83	41 56 20	Surrat	99	24 21 7
Shahaskik	91	29 53 9	Swally wad	99	32 21 25
Shrewsbury	22	35 52 55	Saldania bay	29	45 32 40

T S		Longit.	Latit.	T V		Longit.	Latit.
Silly		18 0	5 70	Toures		27 30	47 50
Stert		22 50	50 40	Trent		40 10	26 10
Sweineburnehead		25 0	59 51	Triago an Iland		278 40	21 0
Syria		74 0	39 0	Tribanta		63 30	41 50
Siracusæ		45 41	37 0	Trinidad		355 20	19 10
Southampton		24 5	51 11	Trinidad		295 50	21 20
T				Trinidad		319 20	9 0
T Aranto		48 0	40 29	Trynity Arbor		308 30	36 0
T Tarapaca		306 21	30 41	Tripolis antiqua		44 21	30 20
Tarbacan		109 29	34 51	Tripolis in Barba.		45 21	30 30
Targa Reg.		32 0	25 0	Tripolis foria		72 21	37 0
Taragona		29 29	40 41	Troyia		59 0	42 30
Tarso		71 21	40 0	Troy		31 0	48 10
Tartar		152 0	63 21	Tuna		41 51	64 30
Tartaria Reg.		130 0	62 0	Turson		131 30	56 30
Tasken Reg.		129 0	49 0	Tyrus		71 35	35 30
Tatracan		55 0	44 51	Tzeroas		79 50	49 20
Tecoû		116 29	0 41	Talao		159 0	3 30
Tenariffe		8 11	27 29	Ternate		160 12	0 30
Tendue Reg.		170 0	59 0	Tidore		160 15	0 10
Tenesab		46 41	61 11	Timor		139 12	10 20
Tarceta		358 23	39 0	V			
Terra alta		160 29	6 51	V Alentia		29 20	39 41
Terra alta		45 21	15 21	V Varcano		107 50	39 0
Ter de los fumos		322 29	40 21	Varon		83 30	70 30
Tharfis		115 21	49 0	Vaygats an Iland		81 30	69 21
Thessalonia		53 44	44 21	Venice		41 40	45 51
Texell in Holland		31 0	53 15	Verma Reg.		133 0	21 30
Thoulouse		28 40	43 50	Varona		40 40	45 50
Thunnis		67 40	32 0	Viana		17 30	42 0
Tygris a Riuer		84 0	34 30	Viatea		87 50	59 30
Tocrors		54 50	46 0	Vienna		45 30	48 30
Togra		146 0	49 50	Villalonga		28 20	7 40
Tolledo		22 20	39 40	Ville conde		17 30	41 30
Tollon		34 5	43 20	Virghia		302 1	36 0
Toul		33 10	40 10	Vishgrod		61 30	51 30

V W	Longit.	Latit.
Bona Vista	4 30	15 30
Buena Vista	308 4	40 11
Buena Vista	177 30	13 30
Vim	37 50	48 50
Volga a riuer	75 40	58 0
Vpsalia	42 50	60 0
Vigis a riuer	85 50	53 20
Visting	79 30	61 30
W		30
VV Aersberghen	39 1	57 20
Wardhouse	50 30	70 26
Earle Warwicks foreland	323 11	62 1
Waterford	17 15	52 16
Count Warwick sound	330 41	64 41
Wakefield	23 48	53 45
Wasfilgo rode	81 50	56 41
Waxon	49 20	52 39
Weimouth	23 50	51 0
Welichy	96 30	56 0
Wilikipoyassa	161 20	63 39
Wolifz	63 40	59 51
Weroy	39 50	68 41
Wesel	21 29	51 29
Westerhold	40 29	67 41
Whitbay	24 26	55 0
Wiborough	56 29	62 35
White Ile	25 11	50 39
Sr. Hugh Willoby Island	60 0	72 0
Winterton	27 20	53 29
Wologda	73 50	59 29
Wologda	74 30	60 0

X Y Z	Longit.	Latit.
X		
X Aques	282 20	20 29
Y		
Y Armouth	27 30	53 0
Yorke	23 30	54 29
Yu gua	303 30	21 0
Yuchope	22 56	56 20
Z		
Z Acana a riuer	6 40	13 0 S
Zacatula	296 40	20 0
Zacotonan Iland	88 0	12 51
Zama	49 30	14 0 S
Zama	74 41	11 41
Zeilam	104 0	8 0
Zanhage Reg.	20 0	24 0
Zanziber	73 52	5 29 S
Zara	46 25	45 41
Zaradrus a riuer	126 0	94 0
Zauan	41 29	51 0
Zedica	48 0	29 29
Zegzeg Reg.	36 41	14 41
Zoua Zembla	83 29	74 0
Zinguis	76 11	49 29
Zoidalanell	137 31	3 51
Zuenziga Reg.	25 0	25 0
FINIS		

